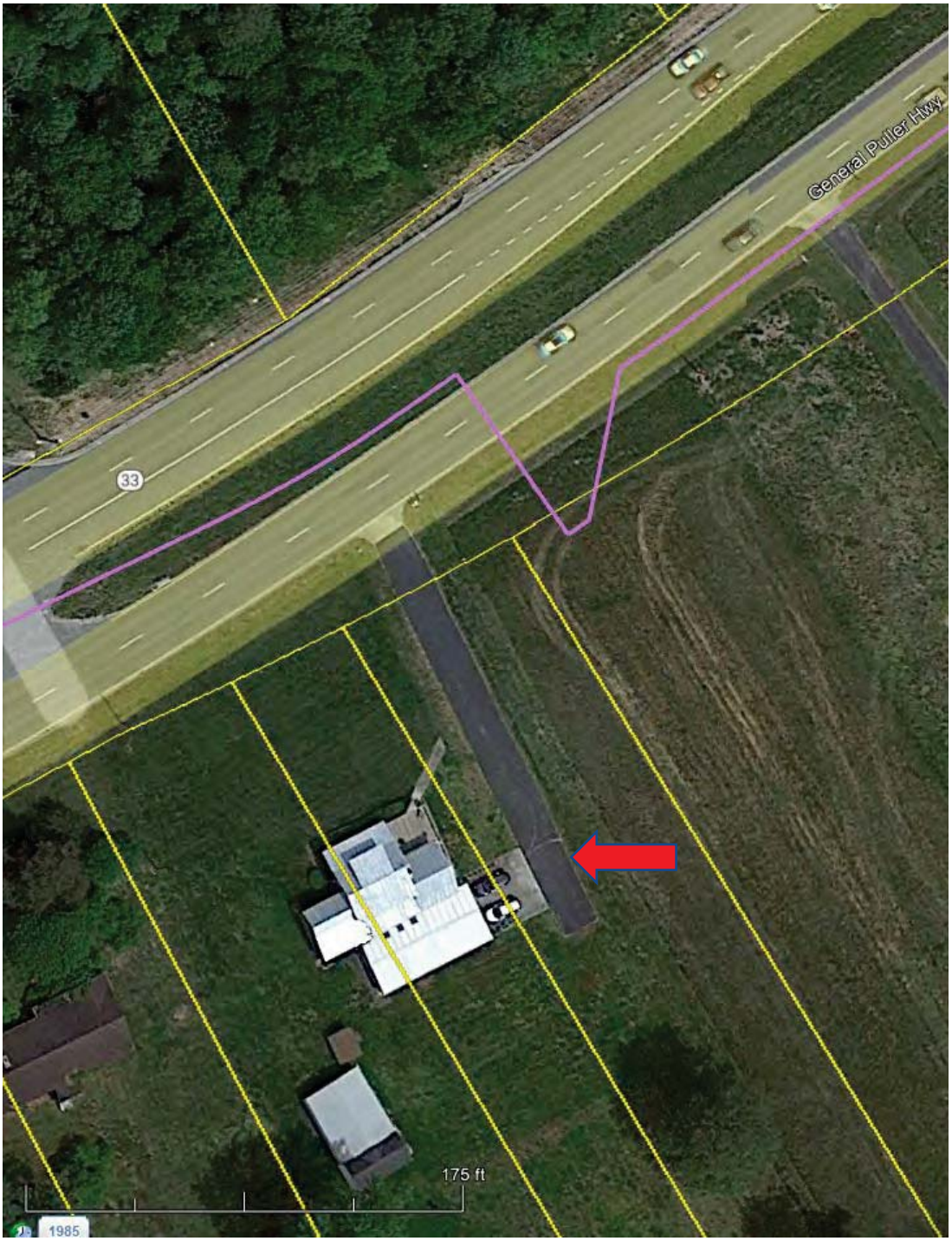


VCRIS No:	pending
Location:	2970 General Puller Hwy Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	33/8

Resource Plan View

N

House – 3036 General Puller Hwy, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 34/ Map Sheet 8

This resource, built in 1959, is a one-story, gable-on-hip cottage. Exterior walls and the foundation are composed of brick laid in a running bond. A bay window with hipped roof projects from the front facade. The main entry and a one-car garage are offset to the north end. The roof is sheathed with asphalt shingles. A three-vehicle garage and attached shed sit to the rear and northward of the house. The yards support some lawn but is sparsely landscaped. To the rear of the house is an extensive woodlot. The property is one of only a few residential structures in the small crossroads hamlet of Cooks Corner.

This unremarkable residence exhibits no distinctive architectural features or historical associations. Tetra Tech recommends that the property is not eligible for listing in the NRHP under Criterion A, B, or C.

View to southeast. June 2, 2022. R. Jacoby

VCRIS No:		
Location:	3036 General Puller Hwy Saluda, Middlesex County	
Resource Type:	house	
NRHP Status:	recommended not eligible	
Tt ID No./Map Sheet	34/8	**Resource Plan View**

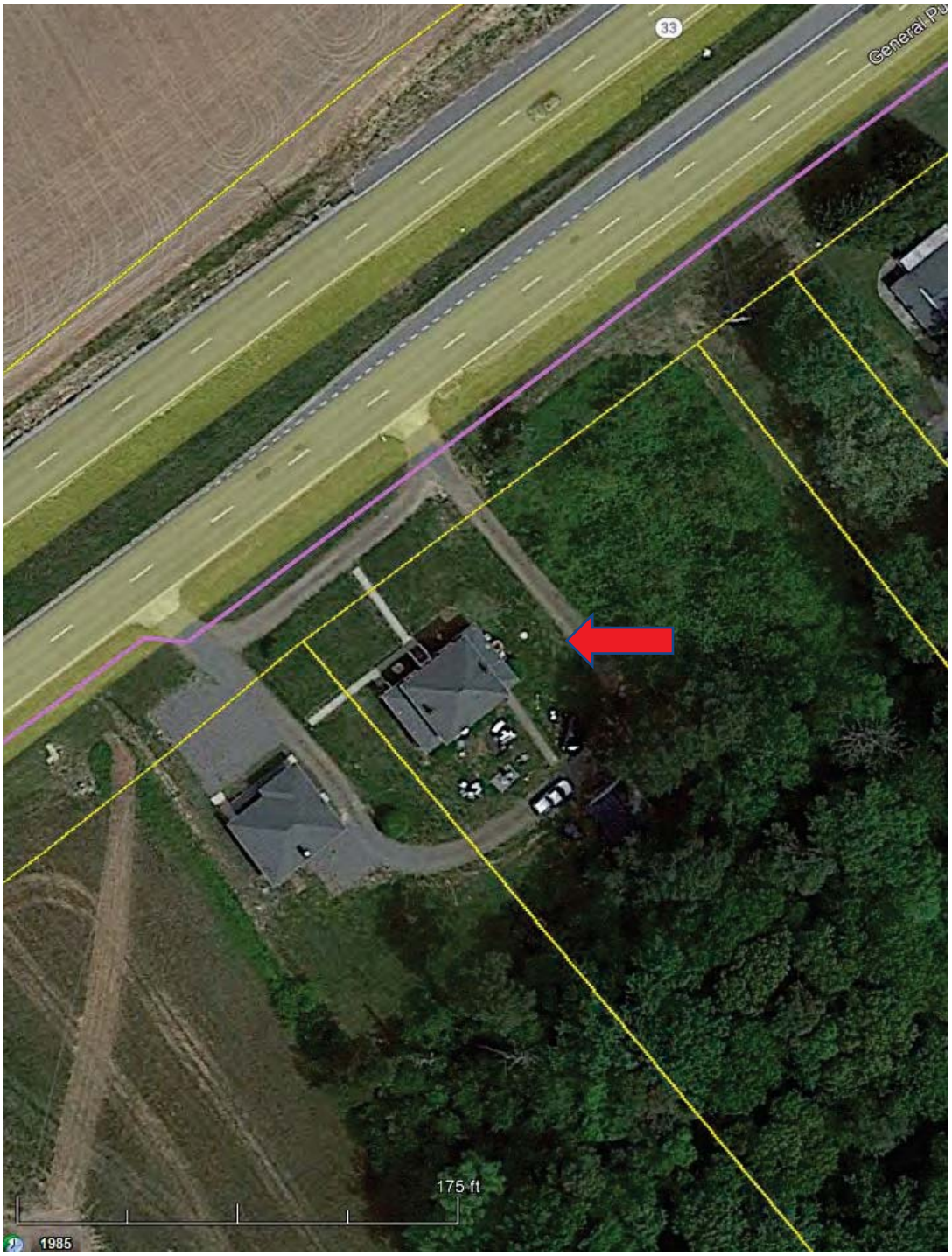
N

House – 3092 General Puller Hwy, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 35/ Map Sheet 8

Built in 1959, this two-story resource is a late example of an American Foursquare house. The main block is topped by a pyramidal roof sheathed with standing-seam metal. Small, one-story wings with hipped roofs are on the south and north elevations. Exterior walls and the foundation are composed of brick laid in a common bond. The main entry, with neo-classical surround, is centered on the front elevation and is approached via several brick steps and a small landing. The south wing, which supports a front entry, displays a continuous row of double sash windows on its southern façade. Two interior brick chimneys extend through the roof near the south and north elevations. The property is one of only a few residential structures in the small crossroads hamlet of Cooks Corner. Fronted with a largely unadorned lawn, the rear of the house faces a dense woodlot.

This resource possesses no distinctive architectural features or historical associations. Tetra Tech recommends that the property is not eligible for listing in the NRHP under Criterion A, B, or C.

View to southeast. June 2, 2022. R. Jacoby



VCRIS No:	pending
Location:	3092 General Puller Hwy Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	35/8

Resource Plan View

N

Commercial Building – 49 Queens Point Drive, Locust Hill, Middlesex County
VDHR No. 059-0047
Tetra Tech ID No. 36/ Map Sheet 14

This resource is a one-story gable-front, commercial building, built circa 1930. Set on a concrete slab, with clapboard cladding and standing-seam metal roof, the building's front gable projects forward about ten feet and is supported by three minimally shaped wood posts. The main entry is centered beneath the overhang, with a pair of two over two double hung sash windows to both sides of the door. Three similar windows are present on the east and west façades. A brick chimney extends through the roof toward the rear. A small L extends off the west elevation. The building is close to the highway and likely functioned as a store for road travelers. It appears to be long unused. Its condition is poor, with the overhang visibly sagging. The fabric and footprint appear to be original, with a high degree of integrity to the structure.

The resource features no distinctive architectural style nor clear historical associations. Tetra Tech recommends that this former commercial building is not NRHP eligible under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby

VCRIS No:	059-0047
Location:	49 Queens Point Drive Locust Hill, Middlesex County
Resource Type:	commercial building
NRHP Status:	not eligible
Tt ID No./Map Sheet	36/14

Resource Plan View

N

House – 49 Queens Point Drive, Locust Hill, Middlesex County
VDHR No. 059-0047
Tetra Tech ID No. 37/ Map Sheet 14

This resource is a two-story side-gabled I-house. Constructed in 1900, it features a hipped-roof front porch that was enclosed, likely sometime in the mid-twentieth century. The house is clad with vinyl siding, the foundation is cinderblock, and the roof is sheathed with asphalt shingles. An interior, brick chimney extends through the ridgeline near the east gable. From the rear of the main block extends a long, one-story addition with a standing-seam meatal roof. Aluminum or vinyl awnings shade the front porch and second floor windows. To the rear of the house are four large sheds, possibly used for agricultural purposes. The property is in the small hamlet of Locust Hill; its immediate setting includes lawn with limited landscaping and is proximate to a broad woodland that extends to the coves along the southern shoreline of the Rappahannock River.

Previously recorded in V-CRIS, the resource was determined not eligible for the NRHP based on the absence of distinctive architectural style and any significant historical associations. Tetra Tech recommends that this former commercial building is not NRHP eligible under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby

VCRIS No:	059-0046
Location:	49 Queens Point Drive Locust Hill, Middlesex County
Resource Type:	house
NRHP Status:	not eligible
Tt ID No./Map Sheet	37/14

Resource Plan View

N

House – 6181 General Puller Hwy, Locust Hill, Middlesex County
VDHR No.
Tetra Tech ID No. 38/ Map Sheet 15

This resource is a 1 ½-story house built in 1948 in an eclectic design of multiple gables and dormers. The side-gabled main block has two single-window dormers to the front and a single two-window dormer to the rear. The main entry is a projecting gable-front block and is approached via four brick steps with a narrow cast iron railing. One-story side-gabled wings have separate entries. A rear addition is beneath a low-pitched extended roof. The various roofs are covered with asphalt shingles. The front elevation and wings are clad in brick running bond; to the rear of the wings, brick cladding is present from the ground level to just below the window sills. Elsewhere, the house is clad with vinyl siding. Set close to the road on the edge of an extensive woodlot, the property contains front and rear lawns with minimal landscaping. The resource is situated in a low-density, semi-rural district near the hamlet of Locust Hill.

This resource possesses no distinctive architectural features or historical associations. Tetra Tech recommends that the property is not eligible for listing in the NRHP under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	6181 General Puller Hwy Locust Hill, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	38/15

Resource Plan View

N

Commercial Building – 6247 General Puller Hwy, Locust Hill, Middlesex County
VDHR No.
Tetra Tech ID No. 39/ Map Sheet 15

This resource, dating from circa 1950, is a one-story commercial building. Oriented gable-front, the building is of cinderblock construction on a concrete slab, with standing-seam metal roof. The eaves extend about a foot beyond the vertical walls. Two large display windows are situated to both sides of the main entry. Two small casement windows are present just below the eaves on both east and west elevations. A small addition extends from the rear. The resource is situated in a low-density, semi-rural district near the hamlet of Locust Hill. Presently unoccupied, this commercial building most recently functioned as a feed store.

This resource possesses no distinctive architectural features or historical associations. Tetra Tech recommends that the property is not eligible for listing in the NRHP under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	6247 General Puller Hwy Locust Hill, Middlesex County
Resource Type:	commercial building
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	39/15

Resource Plan View

N

House – 6277 General Puller Hwy, Locust Hill, Middlesex County
VDHR No.
Tetra Tech ID No. 40/ Map Sheet 16

This resource is a one-story side-gabled cottage. Built circa 1940, the cottage is clad with clapboard on the gable ends and rear elevation and with brick on the front elevation. The roof is covered with standing-seam metal. A small gable front overhang covers the front entry. Aluminum or vinyl awnings shade the windows on the west elevation. Situated close to the road, the house occupies a small parcel at the edge of extensive woodland. The resource is located in a low-density, semi-rural district near the hamlet of Locust Hill.

This resource possesses no distinctive architectural features or historical associations. Tetra Tech recommends that the property is not eligible for listing in the NRHP under Criterion A, B, or C.

View to east. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	6277 General Puller Hwy Locust Hill, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	40/16

Resource Plan View

N

House – 6744 General Puller Hwy, Locust Hill, Middlesex County
VDHR No. 059-0042
Tetra Tech ID No. 41/ Map Sheet 16

This resource, dating to circa 1860, is a two-story, side-gabled house located at the crossroads hamlet of Locust Hill. Material includes clapboard siding, brick foundation, and standing-seam metal roof. A one-story rear-gable addition extends from the rear of the structure. Six over one double-hung sash windows are present on all elevations. Two brick chimneys are present on the ridgeline at either end of the main block and a single chimney is present slightly down-slope of the addition ridgeline. A porch extends across the front elevation beneath a hipped roof, supported by spindle-turned posts and diagonal struts. The house exhibits symmetry of design in window and door placement. The gable eaves contain simple molding and partial returns, suggesting a simplified and late example of Greek Revival style, though rendered in vernacular forms. The house is in good condition and retains significant structural and material integrity.

This resource is recorded in V-CRIS and has been determined not eligible for NRHP listing. However, few residential resources of this period and style situated within rural settings are present within this portion of Middlesex County. Tetra Tech recommends that more research is required to determine whether the resource possesses historic significance under Criterion A and architectural significance under Criterion C.

View to northwest. June 1, 2022. R. Jacoby

VCRIS No:	059-0042
Location:	6744 General Puller Hwy Locust Hill, Middlesex County
Resource Type:	house
NRHP Status:	recommended further study
Tt ID No./Map Sheet	41/16

Resource Plan View

N

Commercial Building – 6914 General Puller Hwy, Locust Hill, Middlesex County
VDHR No.
Tetra Tech ID No. 42/ Map Sheet 16

Built in 1960, this cinderblock commercial building is situated on a well-traveled highway in a semi-rural district around one mile east of the small hamlet of Locust Hill. Set on a concrete slab with a flat, tar and gravel roof, this resource features two front entries with large display windows, possibly representing two separate businesses. An alternative explanation (though only conjecture) is that one door was for whites and the other for African Americans, as at the time of its construction, Jim Crow segregation was the law of the land in the Commonwealth of Virginia. Presently, the building is unused and in a somewhat deleterious state. It will be removed for the placement of the proposed Locust Hill pump station.

The building is a typical roadside commercial establishment, built inexpensively and without ornamentation during the mid-twentieth century, and possesses no architectural significance or notable historical associations. Tetra Tech recommends that this resource is not eligible for NRHP listing under Criterion A, B, or C.

View to southwest. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	6914 General Puller Hwy Locust Hill, Middlesex County
Resource Type:	commercial building
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	42/16

Resource Plan View

N

House – 7056 General Puller Hwy, Locust Hill, Middlesex County
VDHR No. 059-0039
Tetra Tech ID No. 43/ Map Sheet 16

This resource is a two-story, side-gabled house and associated farm dating to the turn of the twentieth century. Clad with clapboard, set on brick piers with cinderblock infill, and with a standing-seam metal roof, this resource is largely screened from the public right-of-way by mature trees. V-CRIS files indicate that fenestration is six over six double hung sash windows, with minimal cornice ornamentation.

VDHR has authored a determination of not eligible for NRHP listing based on the absence of distinctive architectural style or historical associations. Tetra Tech recommends that this source is not eligible for NRHP listing under Criterion A, B, or C.

View to southeast. June 1, 2022. R. Jacoby

VCRIS No:	059-0039
Location:	7056 General Puller Hwy Locust Hill, Middlesex County
Resource Type:	house
NRHP Status:	not eligible
Tt ID No./Map Sheet	43/16

Resource Plan View

N

House – 6863 General Puller Hwy, Locust Hill, Middlesex County
VDHR No. 059-0041
Tetra Tech ID No. 44/ Map Sheet 16

This resource is a two-story, side-gabled I-house, built in 1889. Sided with asbestos shingles, sitting on brick piers, and sheathed with standing-seam metal roofing, this resource was a farmhouse in a rural district about one mile east of the small crossroads hamlet of Locust Hill. A large gable-front dormer is present on the front elevation. Two brick chimneys extend through the ridgeline at opposing gable ends. A second two-story residence is situated perpendicular to the original house, at its rear. Aerial imagery suggests that the two structures are not abutted to one another but rather are connected by a shared walkway or breezeway. A small shed is present to the rear of the house complex. Agricultural fields surround the houses to the southwest, east and northeast, while a small copse of mature trees stands close to the residence. Views of the resource from the public right-of-way are limited.

VDHR has authored a determination of not eligible for NRHP listing based on the absence of distinctive architectural style or historical associations. Tetra Tech recommends that this source is not eligible for NRHP listing under Criterion A, B, or C.

View to north. June 1, 2022. R. Jacoby

VCRIS No:	059-0041
Location:	6863 General Puller Hwy Locust Hill, Middlesex County
Resource Type:	house
NRHP Status:	not eligible
Tt ID No./Map Sheet	44/16

Resource Plan View

N

House – 6961 General Puller Hwy, Locust Hill, Middlesex County
VDHR No. 059-0040
Tetra Tech ID No. 45/ Map Sheet 17

This resource, a residence, is not visible from the public right-of-way.

VDHR staff determined that this property was not eligible for NRHP listing based on the absence of distinctive architectural style or historical associations. Tetra Tech recommends that this source is not eligible for NRHP listing under Criterion A, B, or C.

View to northeast. June 1, 2022. R. Jacoby

VCRIS No:	059-0040
Location:	6961 General Puller Hwy Locust Hill, Middlesex County
Resource Type:	house
NRHP Status:	not eligible
Tt ID No./Map Sheet	45/17

Resource Plan View

N

House – 10801 General Puller Hwy, Locust Hill, Middlesex County
VDHR No. 059-5085
Tetra Tech ID No. 46/ Map Sheet 25

This resource, built in 1940, is a 1 ½-story side-gabled cottage. The front façade features two single-window gable-front dormers while a two-window single dormer faces the rear. The dual-pitched roof and the dormer roofs are sheathed in standing-seam metal. The exterior walls are clad with clapboard; the foundation is cinderblock. Two brick chimneys extend through the roof behind the front dormers. The front roofline extends over a simple, open porch, supported by plain, square wood posts. The condition of the cottage is poor while it retains a high degree of original fabric and original form. The resource's setting comprises an expansive lawn with tree rows to east and west and a thick woodlot to the north. The parcel is located in Hartfield, a small crossroads hamlet bisected by the highway.

The resource previously has been recorded in V-CRIS and has not been evaluated for NRHP eligibility. The house is a common form found in the Middle Peninsula and lacks a distinctive architectural style or significant historical associations. Tetra Tech recommends that this resource is not eligible for NRHP listing under Criterion A, B, or C.

View to north-northwest. June 1, 2022. R. Jacoby

VCRIS No:	059-5085
Location:	10801 General Puller Hwy Hartfield, Middlesex County
Resource Type:	house
NRHP Status:	not evaluated
Tt ID No./Map Sheet	46/25

Resource Plan View

N

House – 10889 General Puller Hwy, Locust Hill, Middlesex County
VDHR No. 059-5084
Tetra Tech ID No. 47/ Map Sheet 25

This resource, built in 1875, is a two-story side-gabled I-house. A one-story gable-end addition extends from the rear. The enclosed front porch is covered with a hipped roof. Twin brick chimneys extend through the ridgeline near the center of the house. Clad with clapboard, the roofs are sheathed with standing-seam metal, and the house sits on brick piers. Fenestration on the front and side elevations is two over two double hung sash windows, a few of which have been boarded up with plywood. A lunette window is present under the eaves on the gable ends. A lawn with some plantings surrounds the house, whose rear faces a dense woodlot. The parcel is located in Hartfield, a small crossroads hamlet bisected by the highway. The house, which has been unoccupied for some years from appearances, is in poor condition but retains a high degree of material and design integrity.

The resource previously has been recorded in V-CRIS and has not been evaluated for NRHP eligibility. The house is typical of late nineteenth century dwellings in the Tidewater region and does not possess a distinctive architectural style or significant historical associations. Tetra Tech recommends that this resource is not eligible for NRHP listing under Criterion A, B, or C.

View to northeast. June 1, 2022. R. Jacoby

VCRIS No:	059-5084
Location:	10889 General Puller Hwy Hartfield, Middlesex County
Resource Type:	house
NRHP Status:	not evaluated
Tt ID No./Map Sheet	47/25

Resource Plan View

N

House – 172 City of Refuge Road, Hartfield, Middlesex County
VDHR No.
Tetra Tech ID No. 48/ Map Sheet 28

This resource is a two-story side-gabled house with a one-story addition on the north gable. The main block, built in 1880, includes a front porch that was enclosed sometime after the Second World War, judging by the presence of louvered windows. The side addition incorporates a dual-pitched roof facing the road. The house is clad with vinyl siding, is roofed with asphalt shingles, and has cinderblock foundation that likely infills an older brick pier or continuous foundation. The north gable of the main block supports an exterior cinderblock chimney. Windows throughout are replacement. The setting for the house is a lawn with limited landscaping, adjacent to a copse of mature trees.

The fabric and footprint of the residence have been considerably altered subsequent to its construction, resulting in a lack of integrity to the structure. The property does not possess a distinctive architectural style or significant historical associations. Tetra Tech recommends that this resource is not eligible for NRHP listing under Criterion A, B, or C.

View to east. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	172 City of Refuge Road Hartfield, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	48/28

Resource Plan View

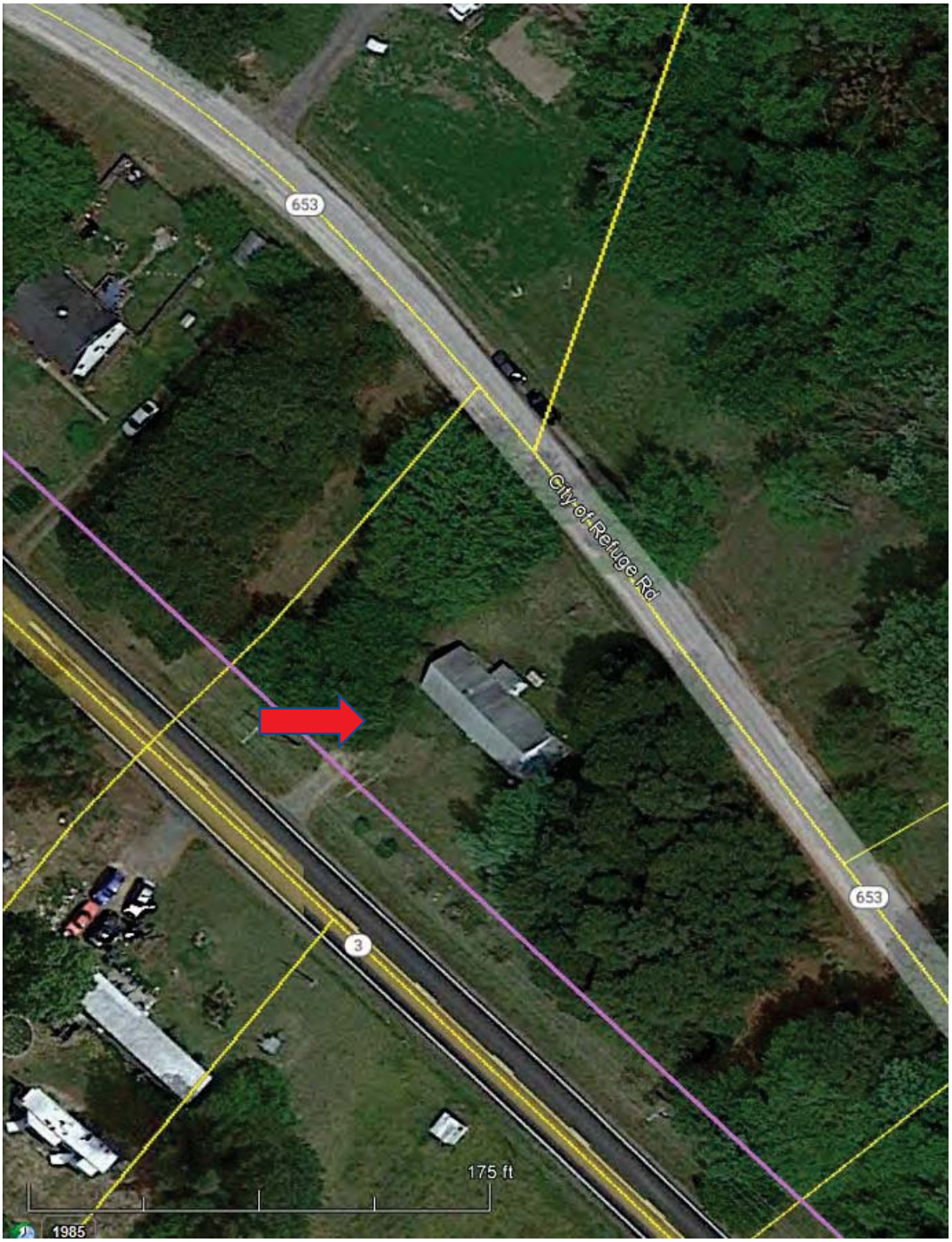
N

House – 2570 Twiggs Ferry Road, Stampers, Middlesex County
VDHR No.
Tetra Tech ID No. 49/ Map Sheet 28

This resource, built in 1961, is a one-story side-gabled house. One bay deep and three bays wide, it has clapboard siding, an asphalt shingle roof, and a cinderblock foundation. A small hipped-roof porch is present on the east gable. The property is in the small hamlet of Stampers, on a small parcel set between City of Refuge Road to the northeast and Twiggs Ferry Road to the southwest. Mature trees are present in the side yards. The condition of the house is fair, and little alteration of its original form is apparent.

This resource lacks any distinctive architectural style or significant historical associations. Tetra Tech recommends that this house as not NRHP eligible under Criterion A, B, or C.

View to northwest. June 1, 2022. R. Jacoby



VCRIS No:	pending
Location:	2570 Twiggs Ferry Road Stampers, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	49/28

Resource Plan View

N

House – 2535 Twiggs Ferry Road, Stampers, Middlesex County
VDHR No.
Tetra Tech ID No. 50/ Map Sheet 28

Built in 1900, this resource is a two-story side-gabled I-house. Two bays wide and one bay deep, it features vinyl siding, a standing-seam metal roof, and is set on brick piers. A small hipped-roof front porch has been enclosed. The replacement windows are one over one vinyl frames with snap-on grids. A one-story shed-roof addition is at the rear. The property is in the small hamlet of Stampers, is fronted by a minimally landscaped lawn and backed by a dense stand of mature trees. Much of the original fabric of the house has been altered; its condition is fair.

This resource possesses no distinctive architectural style or significant historical associations. Tetra Tech recommends that this house as not NRHP eligible under Criterion A, B, or C.

View to southwest. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	2535 Twiggs Ferry Road Stampers, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	50/28

Resource Plan View

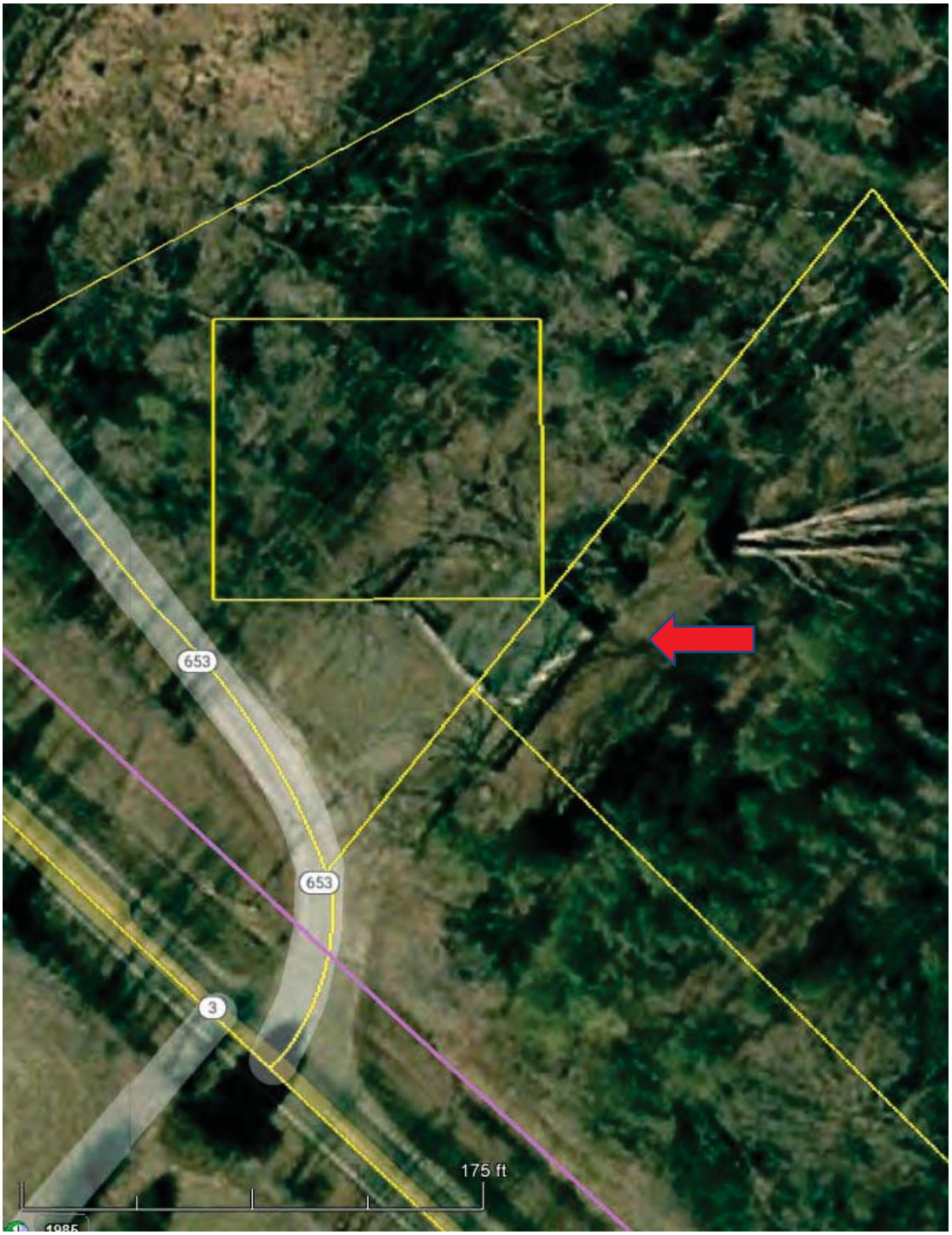
N

City of Refuge Church – 20 City of Refuge Road, Hartfield, Middlesex County
VDHR No. 059-5061
Tetra Tech ID No. 51/ Map Sheet 28

This resource is a one-story gable-front frame church, built circa 1920. The church is clad with clapboard, roofed with asphalt shingles, and sits on brick piers. Exposed rafters and purlins are present in the unboxed eaves, giving the structure a hint of Craftsman styling. Double, paneled doors with plain casing form the main entry, framed on both sides by tall, one over one double hung sash windows. Four similar windows are present on the east façade and three windows on the west, where an exterior cinderblock chimney is supported. Aside from this distinction, the building exhibits a strict symmetry in form and design. The condition of the church is good and it retains a high degree of fabric and design integrity. The church is set on a small parcel surrounded by mature trees in the hamlet of Stampers.

The resource possesses neither distinctive architectural style nor obvious significant historical associations. However, it may be associated with an African American church organization during the Jim Crow era in Middlesex County. Tetra Tech recommends that more research be undertaken to establish potential links to the broader thematic context of African American institutions and cooperative organizations during the early twentieth century.

View to north. June 1, 2022. R. Jacoby



VCRIS No:	059-5061
Location:	20 City of Refuge Road Hartfield, Middlesex County
Resource Type:	Mt. Olive Baptist Church
NRHP Status:	recommended further study
Tt ID No./Map Sheet	51/28

Resource Plan View

N

House – 2376 Twiggs Ferry Road, Stampers, Middlesex County
VDHR No. 059-5008
Tetra Tech ID No. 52/ Map Sheet 28

This resource is a one-story side-gabled cottage. Built in 1944, this dwelling features clapboard siding, brick piers, and asphalt shingle roofing. Three bays wide and two bays deep, the rear is sheltered under a flat roof. Based on differences in window lengths, the rear bay appears to be a later addition. Exposed rafter tails are evident in the unboxed eaves. Much of the original fabric of the house has been retained; its condition is fair. The property is situated in the small hamlet of Stampers; its setting includes a minimally landscaped lawn and some mature trees.

This resource was previously recorded in V-CRIS and was determined not eligible for listing in the NRHP due to the absence of a distinctive architectural style or significant historical associations. Tetra Tech recommends that this house as not NRHP eligible under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby

VCRIS No:	059-5008
Location:	2376 Twiggs Ferry Road Stampers, Middlesex County
Resource Type:	house
NRHP Status:	not eligible
Tt ID No./Map Sheet	52/28

Resource Plan View

N

House – 2346 Twiggs Ferry Road, Stampers, Middlesex County
VDHR No.
Tetra Tech ID No. 53/ Map Sheet 28

This resource is a one-story side-gabled ranch house. Built in 1972, this dwelling features aluminum siding, cinderblock foundation, and asphalt shingle roofing. Three bays wide and two bays deep, the one-car garage is enclosed on the east end. Brick cladding rises from the ground to the window sills on the front elevation. The property is situated in the small hamlet of Stampers; its setting includes a minimally landscaped lawn and some mature trees.

This house represents a common form in the vicinity and lacks a distinctive architectural style or significant historical associations. Tetra Tech recommends that this house as not NRHP eligible under Criterion A, B, or C.

View to northeast. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	2346 Twiggs Ferry Road Stampers, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	53/28

Resource Plan View

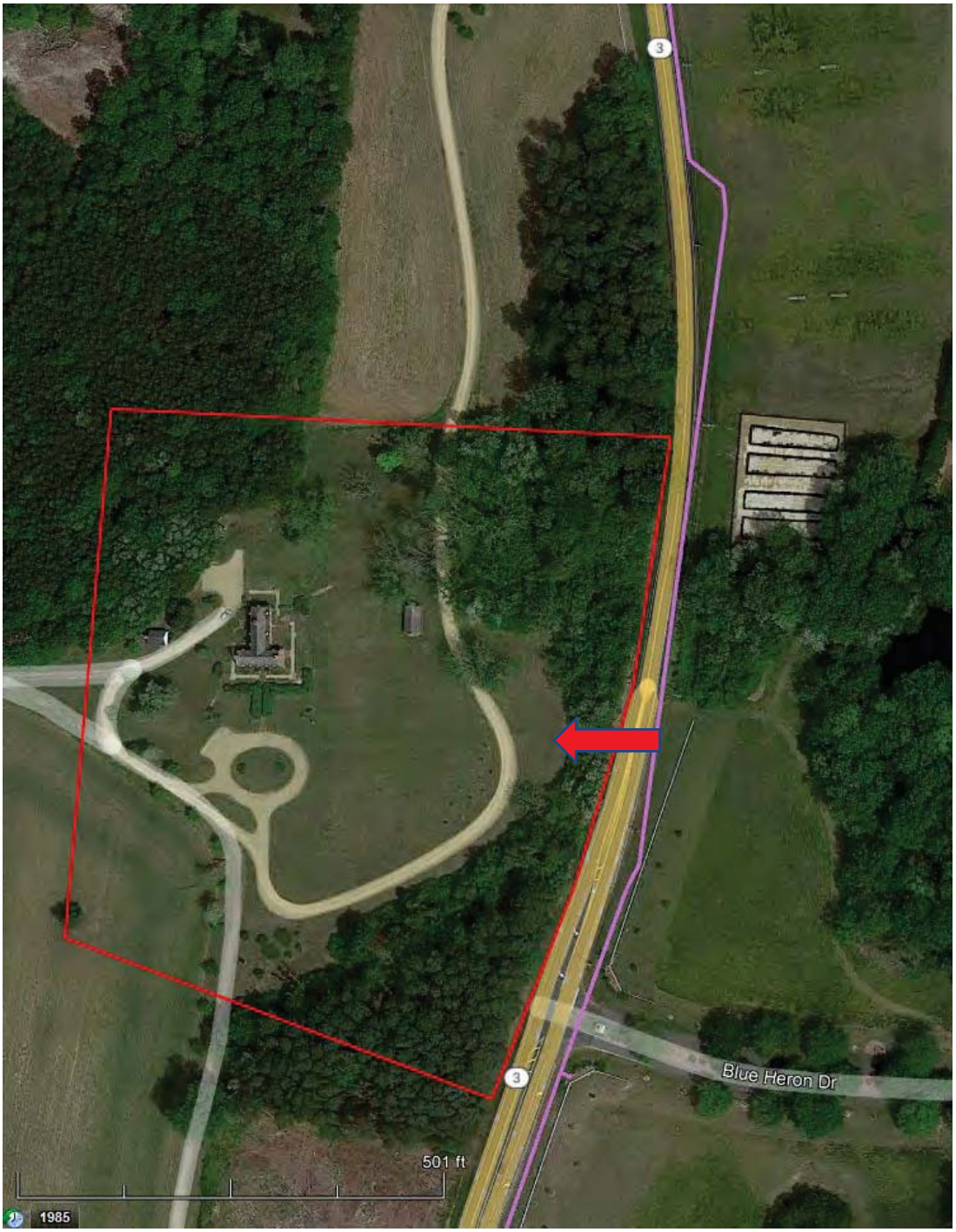
N

Estate – Wilton, Twiggs Ferry Road, Middlesex County
VDHR No. 059-0010
Tetra Tech ID No. 54/ Map Sheet 30

The Wilton estate was the home and plantation of William Churchill (c. 1650-1711) who purchased several thousand acres between the Rappahannock and Piankatank rivers. Churchill's grandson, also named William, built a fine Georgian plantation house in 1763. The estate remained within the Churchill family until 1829. At present, the house, plus approximately 26 acres of farmland and woodlot, is listed in the NRHP under Criterion C as an excellent example of mid-eighteenth century colonial architecture in Virginia.

A section of the listed property abuts Twiggs Ferry Road, along which the Project will be installed. The manor house is completely screened by the adjoining woodlot from the proposed Project activities. Tetra Tech concludes that the temporary indirect visual effects generated by the Project will not alter or diminish the characteristics for which Wilton is considered NRHP eligible. Tetra Tech recommends that Wilton will retain its architectural significance and not be adversely affected by Project activities.

View to northeast. June 2, 2022. R. Jacoby



VCRIS No:	059-0010
Location:	1637 Twiggs Ferry Road Hartfield, Middlesex County
Resource Type:	Wilton Historic District
NRHP Status:	listed
Tt ID No./Map Sheet	54/30

Resource Plan View

N

John Andrews Twigg Bridge – Middlesex and Mathews Counties
VDHR No. 057-5047
Tetra Tech ID No. 55/ Map Sheet 33

Built in 1953, the John Andrews Twigg Bridge over the Piankatank River is an example of a steel beam and concrete deck design supported by concrete piers. The bridge has a length of 2,092 feet. In accordance with a statewide evaluation agreement between the Virginia Department of Transportation and VDHR, this type of bridge is generally excluded from inclusion in the NRHP. Due to its length, the Twigg Bridge meets an exception to this agreement. The Historic Structures Task Group determined that this resource does not meet the criteria of significance for NRHP eligibility.

Tetra Tech recommends that the John Andrews Twigg Bridge does not possess qualities of architectural, engineering or historical significance, and will not be adversely affected by proposed Project activities.

View to south. June 27, 2022. A. Maskevich

VCRIS No:	057-5047
Location:	Route 3 over Piankatank River Middlesex County and Mathews County
Resource Type:	bridge
NRHP Status:	not eligible
Tt ID No./Map Sheet	55/33

Resource Plan View

N

Zion Methodist Church – 9496 John Clayton Memorial Highway, Gloucester
VDHR No. 036-0130
Tetra Tech ID No. 56/ Map Sheet 38

The resource is situated on a low knoll, set back about 225 feet from the road. Built in 1960, the sanctuary is a gable-front structure with vinyl siding, cinderblock foundation, and standing seam metal roof. The front elevation exhibits an arched window with twin entries to both sides that are reached by brick steps extending across most of the width of the elevation. A one-story wing on the north end contains a classroom and kitchen, and has vinyl siding, cinderblock foundation, and asphalt shingle roof. A small cemetery sits in front of the church and features mid to late-twentieth century burial dates. The absence of ornamental details in the church design speaks of the Methodist adherence to a moral code that emphasized self-sacrifice, restraint, and a rejection of luxury.

The resource is typical of small rural churches established across Virginia in the early to mid-twentieth century and does not exhibit distinctive architectural characteristics. The property is recorded in V-CRIS and has been determined to be not eligible for the NRHP. Tetra Tech recommends that the Zion Methodist Church retain its status as not eligible for listing in the NRHP under Criterion A, B, or C.

View to southwest. June 1, 2022. R. Jacoby

VCRIS No:	036-0130
Location:	9496 John Clayton Memorial Hwy Gloucester, Gloucester County
Resource Type:	Zion Methodist Church
NRHP Status:	not eligible
Tt ID No./Map Sheet	56/38

Resource Plan View

N

NOTICE OF PUBLIC HEARING EXAMPLE

The County of Middlesex Virginia will be conducting a 'Public Hearing' on **XXXXX, XXXX XX, XXXX at XX:00h / X:00pm** at the Historic Courthouse, 865 General Puller Highway Saluda, VA 23149, into the Environmental Assessment for:

YR013900 Middlesex Interceptor System Program Phase II.

In accordance with Virginia Department of Environmental Quality's Procedural Guidelines for the Virginia Clean Water Revolving Loan Fund Section 7 Selected Alternative (4). The public hearing will be held for the purpose of discussing the project, alternatives considered, environmental impact, project costs, and associated user charge impact. The Environmental Assessment will be available at www.HRSD.com/construction-status and www.co.Middlesex.va.us. A record of the hearing proceedings will be kept.

For further information, please contact us at:

Projects@hrsd.com

From: Haynes, Stephen
Sent: Tuesday, September 28, 2021 2:57 PM
To: EIR Coordination, rr; Painter, Debbie
Subject: Re: Project Review Request for Middlesex Interceptor System Program Phase II

Good afternoon,

There are no known proposed or programmed improvements along the following routes, at this time -
Middlesex County:

Rte 227 from Urbanna to Rte 33
Rte 33 from Rte 227 to Rte 3 (Hartfield)
Rte 3 from Rte 33 to the Mathews Co Line (Piankatank R)

Mathews County:

Rte 3 from Middlesex Co Line (Piankatank R) to Rte 3/198 Intersection

In terms of impacts to existing transportation facilities, all of those listed would be impacted by the construction of a new sewage force main located within and parallel to the Virginia Department of Transportation right of way, according to the document provided.

Thank you.

Stephen Haynes
Fredericksburg District Planning Manager
Virginia Department of Transportation
540-899-4709
stephen.haynes@VDOT.Virginia.gov

On Fri, Sep 24, 2021 at 5:45 PM EIR Coordination, rr <eir.coordination@vdot.virginia.gov> wrote:

> DATE: September 24, 2021
> TO: District Transportation Planning
> PROJECT: Middlesex Interceptor System Program Phase II
> DEQ PROJECT: N/A
> LOCATION: Matthews and Middlesex Counties
> SUBJECT: Comment Request for Environmental Assessment
>
> Please review the attached project materials for impacts to existing and proposed transportation facilities, and send any comments you might have directly to Deborah Painter (debbie.painter@tetratech.com) and copy the VDOT EIR email (eir.coordination@vdot.virginia.gov).
>
> Thank you,
> Kirk Millikan

Environmental Impact Review Mailbox
Environmental Division
Virginia Department of Transportation
eir.coordination@vdot.virginia.gov

MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
Urbanna, VA 23175

Inquiry Number: 6051134.2s
April 28, 2020

EDR Area / Corridor Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

SUBJECT PROPERTY INFORMATION

ADDRESS

URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

TARGET PROPERTY SEARCH RESULTS

The Target Property was identified in the following databases.

Page Numbers and Map Identifcations refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

STANDARD ENVIRONMENTAL RECORDS

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Tracking Database

A review of the LUST list, as provided by EDR, has revealed that there is 1 LUST site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
7 ELEVEN INCORPORATE	***11102 GENERAL PULLER***	***A5 / 6***	***36***
Database: LUST REG PD, Date of Government Version: 12/02/2014 Facility Status: Closed Pollution Complaint #: 20114166 Pollution Complaint #: 20114147 Pollution Complaint #: 20084342			

LTANKS: Leaking Petroleum Storage Tanks

A review of the LTANKS list, as provided by EDR, and dated 11/04/2019 has revealed that there is 1 LTANKS site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
7 ELEVEN INCORPORATE	***11102 GENERAL PULLER***	***A5 / 6***	***36***
Facility Status: Closed CEDS Facility Id: 200000165442 Pollution Complaint #: 20114166			

Pollution Complaint #: 20114147
Pollution Complaint #: 20084342

State and tribal registered storage tank lists

UST: Registered Petroleum Storage Tanks

A review of the UST list, as provided by EDR, and dated 11/01/2019 has revealed that there is 1 UST site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
7 ELEVEN INCORPORATE Tank Status: CLS IN GRD Tank Status: REM FROM GRD Tank Status: CURR IN USE Facility Id: 4018362 CEDS Facility ID: 200000165442	***11102 GENERAL PULLER***	***A4 / 6***	***25***

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

ICIS: Integrated Compliance Information System

A review of the ICIS list, as provided by EDR, and dated 11/18/2016 has revealed that there is 1 ICIS site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
XCELPLUS INTERNATION FRS ID:: 110024538598	***5041 GENERAL PULLER***	***1 / 3***	***24***

FINDS: Facility Index System/Facility Registry System

A review of the FINDS list, as provided by EDR, and dated 11/22/2019 has revealed that there are 2 FINDS sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
XCELPLUS INTERNATION Registry ID:: 110024538598	***5041 GENERAL PULLER***	***1 / 3***	***24***
VDACS PESTICIDE COLL Registry ID:: 110067265248	***5730 GENERAL PULLER***	***2 / 4***	***24***

EXECUTIVE SUMMARY

ECHO: Enforcement & Compliance History Information

A review of the ECHO list, as provided by EDR, and dated 01/05/2020 has revealed that there is 1 ECHO site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
VDACS PESTICIDE COLL	***5730 GENERAL PULLER***	***2 / 4***	***24***
Registry ID: 110067265248			

Financial Assurance: Financial Assurance Information Listing

A review of the Financial Assurance list, as provided by EDR, has revealed that there is 1 Financial Assurance site within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
7 ELEVEN INCORPORATE	***11102 GENERAL PULLER***	***A4 / 6***	***25***
Database: Financial Assurance 1, Date of Government Version: 01/27/2020			
Facility ID: 4018362			
ROF Own Id: 38838			

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

A review of the RGA LUST list, as provided by EDR, has revealed that there are 2 RGA LUST sites within the requested target property.

Site	Address	Map ID / Focus Map(s)	Page
LITTLE SUE 136	11102 GENERAL PULLER	A3 / 6	25
7 ELEVEN INCORPORATE	11102 GENERAL PULLER	A6 / 6	38

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Page Numbers and Map Identifcations refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Tracking Database

A review of the LUST list, as provided by EDR, has revealed that there is 1 LUST site within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
THRIFT OIL	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B10 / 2***	***77***
Database: LUST REG PD, Date of Government Version: 12/02/2014 Facility Status: Closed Pollution Complaint #: 19984155				

LTANKS: Leaking Petroleum Storage Tanks

A review of the LTANKS list, as provided by EDR, and dated 11/04/2019 has revealed that there are 2 LTANKS sites within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
THRIFT OIL Facility Status: Closed CEDS Facility Id: 200000159612 Pollution Complaint #: 19984155	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B10 / 2***	***77***
J. T. & C. A. THRIFT Facility Status: Open CEDS Facility Id: 200000159612 Pollution Complaint #: 20184442	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B12 / 2***	***81***

State and tribal registered storage tank lists

UST: Registered Petroleum Storage Tanks

A review of the UST list, as provided by EDR, and dated 11/01/2019 has revealed that there are 2 UST sites within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
THRIFT OIL COMPANY Tank Status: REM FROM GRD Facility Id: 4012594 CEDS Facility ID: 200000159612	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B8 / 2***	***39***
PARVINS SUPER MARKET Tank Status: REM FROM GRD Facility Id: 4002797 CEDS Facility ID: 200000168116	5041 GENERAL PULLER	NNE 0 - 1/8 (0.020 mi.)	C16 / 3	85

AST: Registered Petroleum Storage Tanks

A review of the AST list, as provided by EDR, and dated 11/01/2019 has revealed that there is 1 AST site within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
THRIFT OIL COMPANY	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B8 / 2***	***39***
Facility ID: 4012594				
CEDS Facility ID: 200000159612				

ADDITIONAL ENVIRONMENTAL RECORDS

Records of Emergency Release Reports

SPILLS: Prep/Spills Database Listing

A review of the SPILLS list, as provided by EDR, has revealed that there is 1 SPILLS site within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
Not reported	52 TWIGGS FERRY ROAD	ENE 0 - 1/8 (0.016 mi.)	14 / 9	83
Database: SPILLS, Date of Government Version: 11/04/2019				
Facility Status: Closed				
IR Number: 2015-P-2392				

Other Ascertainable Records

US AIRS: Aerometric Information Retrieval System Facility Subsystem

A review of the US AIRS list, as provided by EDR, has revealed that there is 1 US AIRS site within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
J T AND C A THRIFT I	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B11 / 2***	***79***
Database: US AIRS MINOR, Date of Government Version: 10/12/2016				
EPA plant ID:: 110007319543				

FINDS: Facility Index System/Facility Registry System

A review of the FINDS list, as provided by EDR, and dated 11/22/2019 has revealed that there are 3 FINDS sites within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
J T THRIFT OIL EXXON	2742 GENERAL PULLER	SSE 0 - 1/8 (0.014 mi.)	B9 / 2	77
Registry ID:: 110020672388				
J T AND C A THRIFT I	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B11 / 2***	***79***
Registry ID:: 110007319543				
GOODGIRL INDUSTRIES	5041 GENERAL PULLER	NNE 0 - 1/8 (0.020 mi.)	C15 / 3	85

Registry ID:: 110070334863

ECHO: Enforcement & Compliance History Information

A review of the ECHO list, as provided by EDR, and dated 01/05/2020 has revealed that there is 1 ECHO site within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
J T AND C A THRIFT I Registry ID: 110007319543	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B11 / 2***	***79***

TIER 2: Tier 2 Information Listing

A review of the TIER 2 list, as provided by EDR, and dated 12/31/2014 has revealed that there are 5 TIER 2 sites within approximately 0.028 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
MEHERRIN AG & CHEMIC	5730 GENERAL PULLER	NE 0 - 1/8 (0.013 mi.)	7 / 4	38
THRIFT OIL	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B10 / 2***	***77***
J. T. & C. A. THRIFT	***2742 GENERAL PULLER***	***SSE 0 - 1/8 (0.014 mi.)***	***B12 / 2***	***81***
REVERE GAS, INC.	11128 GENERAL PULLER	SSW 0 - 1/8 (0.027 mi.)	D17 / 6	92
REVERE GAS & APPLIAN	11128 GENERAL PULLER	SSW 0 - 1/8 (0.027 mi.)	D18 / 6	93

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

A review of the RGA LUST list, as provided by EDR, has revealed that there is 1 RGA LUST site within approximately 0.028 miles of the requested target property.

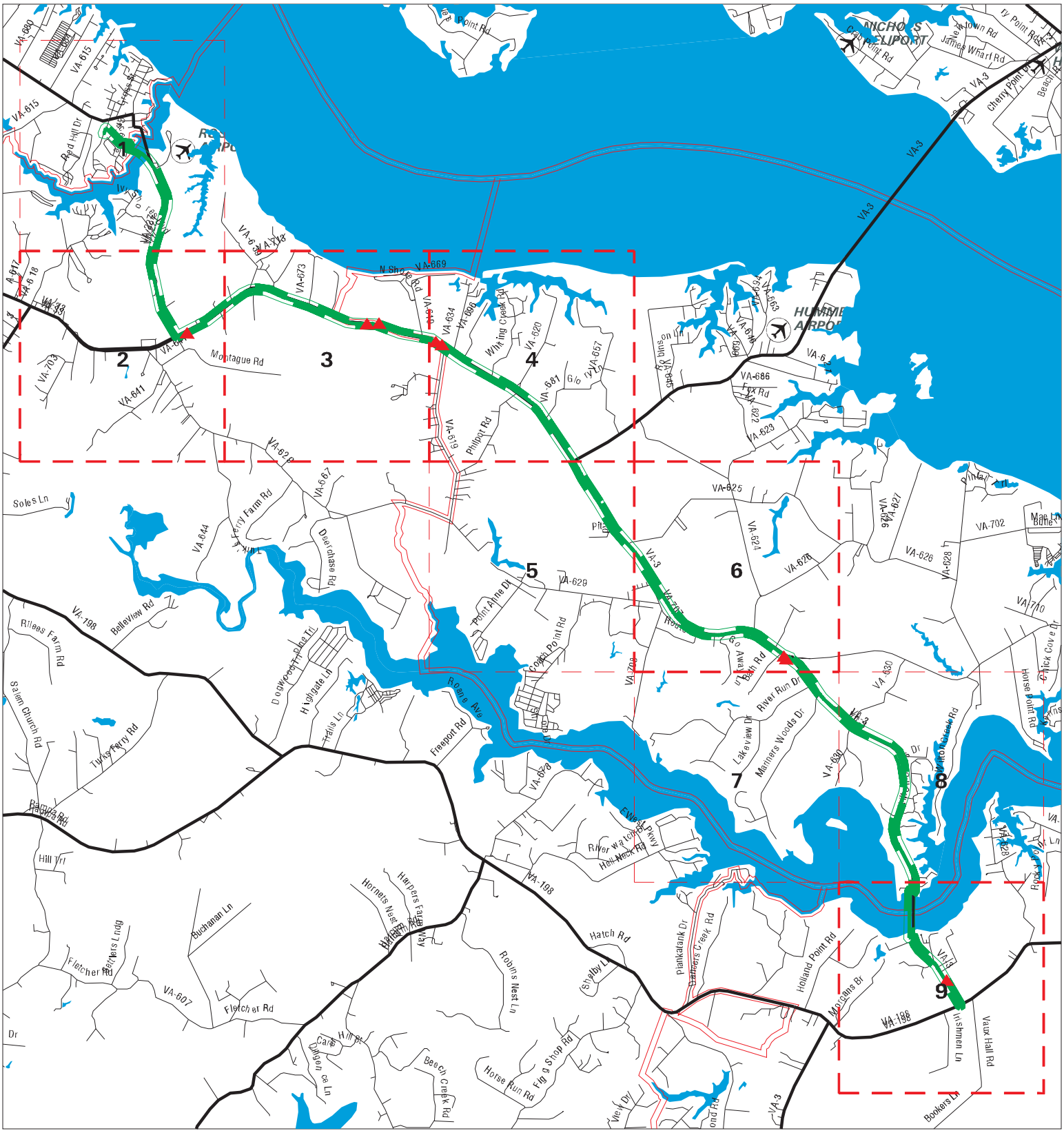
Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
THRIFT OIL	2742 GENERAL PULLER	SSE 0 - 1/8 (0.014 mi.)	B13 / 2	83

MAPPED SITES SUMMARY

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
1 / 3	XCELPLUS INTERNATION	5041 GENERAL PULLER	ICIS, FINDS	TP
2 / 4	VDACS PESTICIDE COLL	5730 GENERAL PULLER	FINDS, ECHO	TP
A3 / 6	LITTLE SUE 136	11102 GENERAL PULLER	RGA LUST	TP
A4 / 6	7 ELEVEN INCORPORATE	11102 GENERAL PULLER	UST, Financial Assurance	TP
A5 / 6	7 ELEVEN INCORPORATE	11102 GENERAL PULLER	LUST, LTANKS	TP
A6 / 6	7 ELEVEN INCORPORATE	11102 GENERAL PULLER	RGA LUST	TP
7 / 4	MEHERRIN AG & CHEMIC	5730 GENERAL PULLER	TIER 2	67 0.013 NE
B8 / 2	THRIFT OIL COMPANY	2742 GENERAL PULLER	UST, AST	75 0.014 SSE
B9 / 2	J T THRIFT OIL EXXON	2742 GENERAL PULLER	FINDS	75 0.014 SSE
B10 / 2	THRIFT OIL	2742 GENERAL PULLER	LUST, LTANKS, TIER 2	75 0.014 SSE
B11 / 2	J T AND C A THRIFT I	2742 GENERAL PULLER	US AIRS, FINDS, ECHO	75 0.014 SSE
B12 / 2	J. T. & C. A. THRIFT	2742 GENERAL PULLER	LTANKS, TIER 2	75 0.014 SSE
B13 / 2	THRIFT OIL	2742 GENERAL PULLER	RGA LUST	75 0.014 SSE
14 / 9		52 TWIGGS FERRY ROAD	SPILLS	82 0.016 ENE
C15 / 3	GOODGIRL INDUSTRIES	5041 GENERAL PULLER	FINDS	107 0.020 NNE
C16 / 3	PARVINS SUPER MARKET	5041 GENERAL PULLER	UST	107 0.020 NNE
D17 / 6	REVERE GAS, INC.	11128 GENERAL PULLER	TIER 2	143 0.027 SSW
D18 / 6	REVERE GAS & APPLIAN	11128 GENERAL PULLER	TIER 2	143 0.027 SSW

Key Map - 6051134.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1 2 Miles

SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE III	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20 2:09 PM

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	0.028		0	NR	NR	NR	NR	0
Proposed NPL	0.028		0	NR	NR	NR	NR	0
NPL LIENS	0.028		0	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	0.028		0	NR	NR	NR	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.028		0	NR	NR	NR	NR	0
SEMS	0.028		0	NR	NR	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.028		0	NR	NR	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	0.028		0	NR	NR	NR	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.028		0	NR	NR	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.028		0	NR	NR	NR	NR	0
RCRA-SQG	0.028		0	NR	NR	NR	NR	0
RCRA-VSQG	0.028		0	NR	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.028		0	NR	NR	NR	NR	0
US ENG CONTROLS	0.028		0	NR	NR	NR	NR	0
US INST CONTROLS	0.028		0	NR	NR	NR	NR	0
Federal ERNS list								
ERNS	0.028		0	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.028		0	NR	NR	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.028	1	1	NR	NR	NR	NR	2
INDIAN LUST	0.028		0	NR	NR	NR	NR	0
LTANKS	0.028	1	2	NR	NR	NR	NR	3
State and tribal registered storage tank lists								
FEMA UST	0.028		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
UST	0.028	1	2	NR	NR	NR	NR	3
AST	0.028		1	NR	NR	NR	NR	1
INDIAN UST	0.028		0	NR	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.028		0	NR	NR	NR	NR	0
INST CONTROL	0.028		0	NR	NR	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.028		0	NR	NR	NR	NR	0
VCP	0.028		0	NR	NR	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.028		0	NR	NR	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.028		0	NR	NR	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
INDIAN ODI	0.028		0	NR	NR	NR	NR	0
ODI	0.028		0	NR	NR	NR	NR	0
DEBRIS REGION 9	0.028		0	NR	NR	NR	NR	0
IHS OPEN DUMPS	0.028		0	NR	NR	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.028		0	NR	NR	NR	NR	0
US CDL	0.028		0	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	0.028		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.028		0	NR	NR	NR	NR	0
SPILLS	0.028		1	NR	NR	NR	NR	1
SPILLS 90	0.028		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.028		0	NR	NR	NR	NR	0
FUDS	0.028		0	NR	NR	NR	NR	0
DOD	0.028		0	NR	NR	NR	NR	0
SCRD DRYCLEANERS	0.028		0	NR	NR	NR	NR	0
US FIN ASSUR	0.028		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.028		0	NR	NR	NR	NR	0
2020 COR ACTION	0.028		0	NR	NR	NR	NR	0
TSCA	0.028		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TRIS	0.028		0	NR	NR	NR	NR	0
SSTS	0.028		0	NR	NR	NR	NR	0
ROD	0.028		0	NR	NR	NR	NR	0
RMP	0.028		0	NR	NR	NR	NR	0
RAATS	0.028		0	NR	NR	NR	NR	0
PRP	0.028		0	NR	NR	NR	NR	0
PADS	0.028		0	NR	NR	NR	NR	0
ICIS	0.028	1	0	NR	NR	NR	NR	1
FTTS	0.028		0	NR	NR	NR	NR	0
MLTS	0.028		0	NR	NR	NR	NR	0
COAL ASH DOE	0.028		0	NR	NR	NR	NR	0
COAL ASH EPA	0.028		0	NR	NR	NR	NR	0
PCB TRANSFORMER	0.028		0	NR	NR	NR	NR	0
RADINFO	0.028		0	NR	NR	NR	NR	0
HIST FTTS	0.028		0	NR	NR	NR	NR	0
DOT OPS	0.028		0	NR	NR	NR	NR	0
CONSENT	0.028		0	NR	NR	NR	NR	0
INDIAN RESERV	0.028		0	NR	NR	NR	NR	0
FUSRAP	0.028		0	NR	NR	NR	NR	0
UMTRA	0.028		0	NR	NR	NR	NR	0
LEAD SMELTERS	0.028		0	NR	NR	NR	NR	0
US AIRS	0.028		1	NR	NR	NR	NR	1
US MINES	0.028		0	NR	NR	NR	NR	0
ABANDONED MINES	0.028		0	NR	NR	NR	NR	0
FINDS	0.028	2	3	NR	NR	NR	NR	5
ECHO	0.028	1	1	NR	NR	NR	NR	2
DOCKET HWC	0.028		0	NR	NR	NR	NR	0
UXO	0.028		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.028		0	NR	NR	NR	NR	0
AIRS	0.028		0	NR	NR	NR	NR	0
NPDES	0.028		0	NR	NR	NR	NR	0
COAL ASH	0.028		0	NR	NR	NR	NR	0
DRYCLEANERS	0.028		0	NR	NR	NR	NR	0
ENF	0.028		0	NR	NR	NR	NR	0
Financial Assurance	0.028	1	0	NR	NR	NR	NR	1
TIER 2	0.028		5	NR	NR	NR	NR	5
UIC	0.028		0	NR	NR	NR	NR	0
MINES MRDS	0.028		0	NR	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	0.028		0	NR	NR	NR	NR	0
EDR Hist Auto	0.028		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.028		0	NR	NR	NR	NR	0

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF	0.028		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
RGA LUST	0.028	2	1	NR	NR	NR	NR	3
- Totals --		10	18	0	0	0	0	28

NOTES:

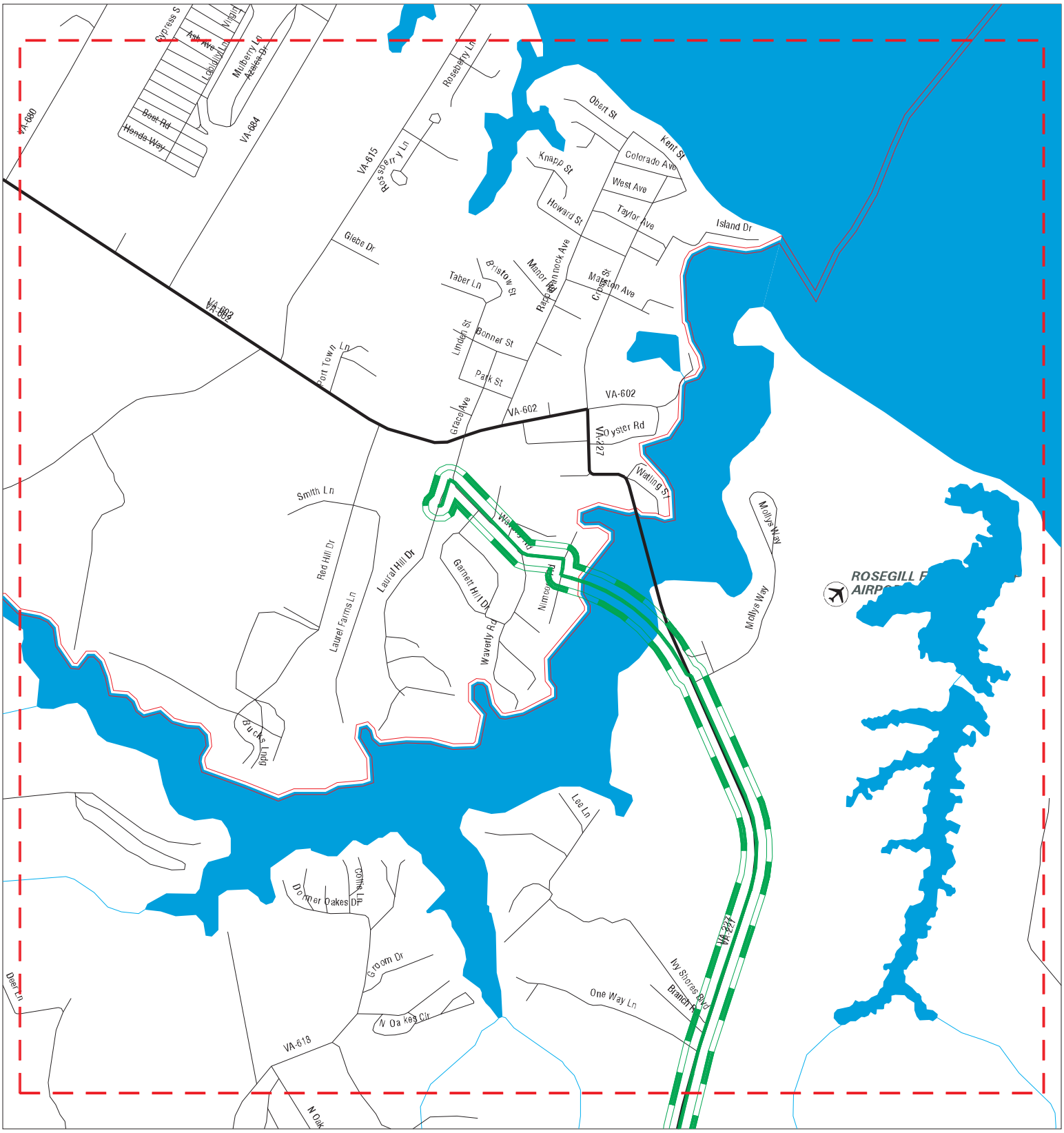
TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

Focus Map - 1 - 6051134.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

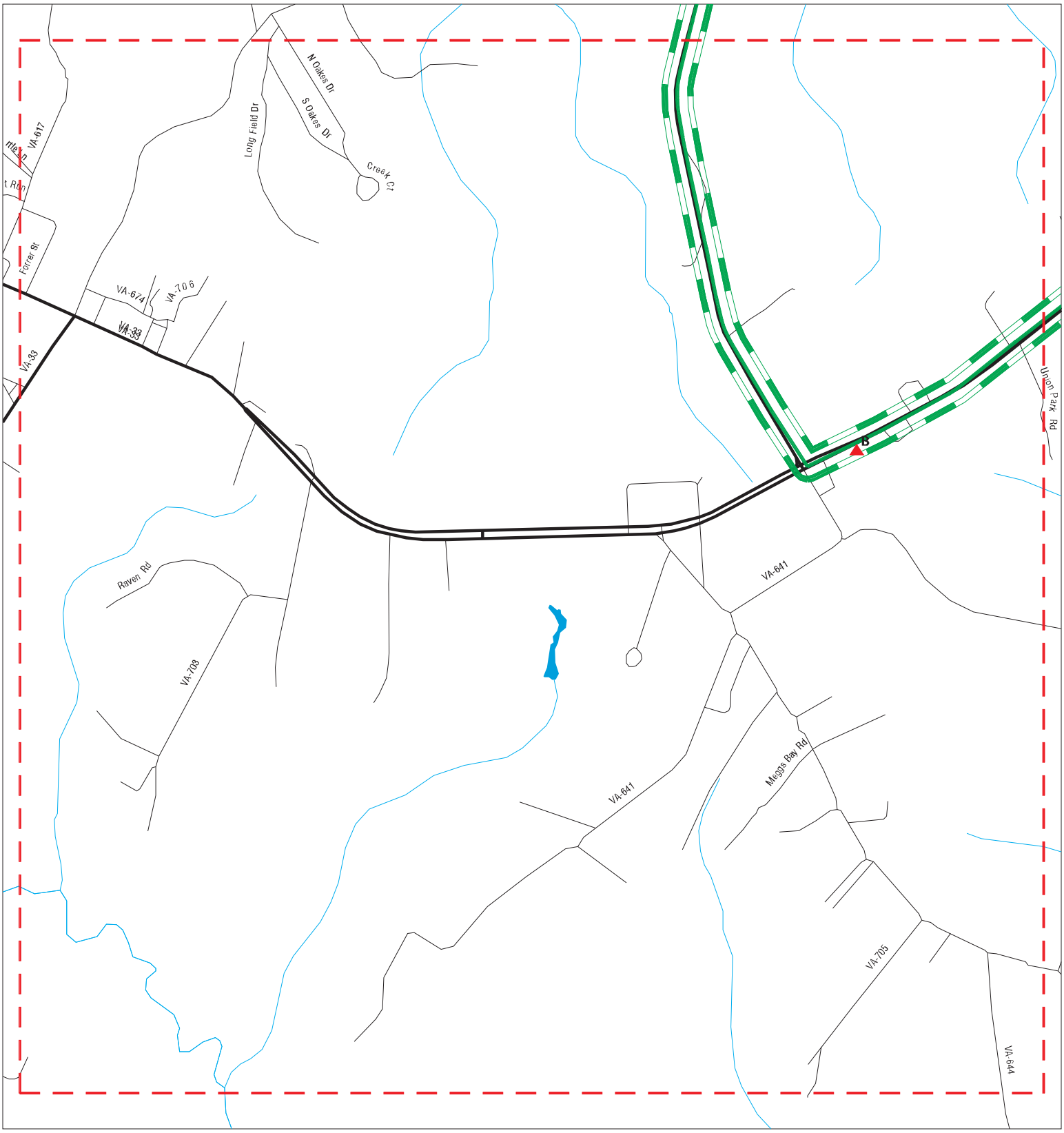
MAPPED SITES SUMMARY - FOCUS MAP 1

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 2 - 6051134.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

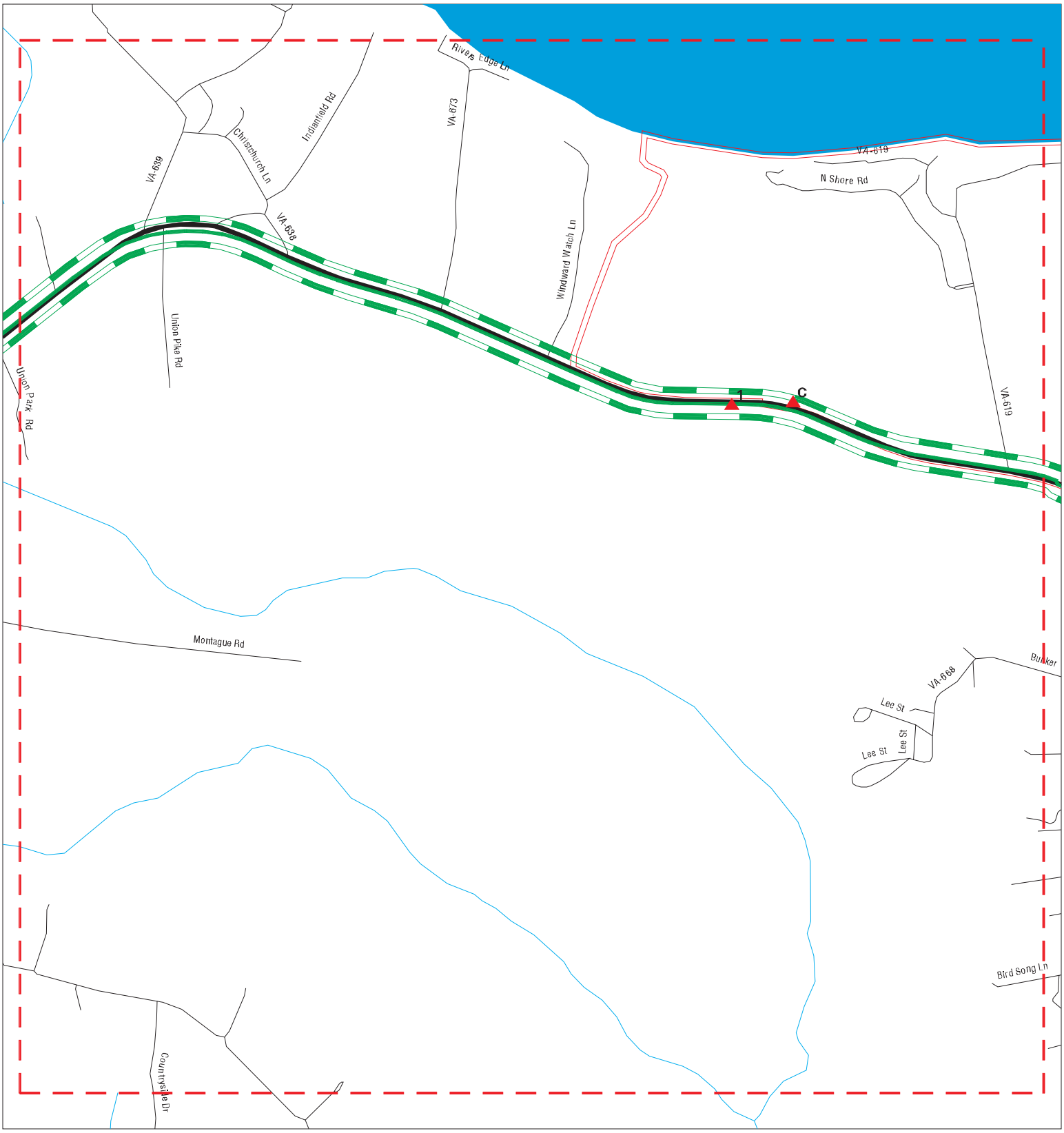
SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

MAPPED SITES SUMMARY - FOCUS MAP 2

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION		
B8 / 2	THRIFT OIL COMPANY	2742 GENERAL PULLER	UST, AST	75	0.014	SSE
B9 / 2	J T THRIFT OIL EXXON	2742 GENERAL PULLER	FINDS	75	0.014	SSE
B10 / 2	THRIFT OIL	2742 GENERAL PULLER	LUST, LTANKS, TIER 2	75	0.014	SSE
B11 / 2	J T AND C A THRIFT I	2742 GENERAL PULLER	US AIRS, FINDS, ECHO	75	0.014	SSE
B12 / 2	J. T. & C. A. THRIFT	2742 GENERAL PULLER	LTANKS, TIER 2	75	0.014	SSE
B13 / 2	THRIFT OIL	2742 GENERAL PULLER	RGA LUST	75	0.014	SSE

Focus Map - 3 - 6051134.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE III	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

MAPPED SITES SUMMARY - FOCUS MAP 3

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
1 / 3	XCELPLUS INTERNATION	5041 GENERAL PULLER	ICIS, FINDS	TP
C15 / 3	GOODGIRL INDUSTRIES	5041 GENERAL PULLER	FINDS	107 0.020 NNE
C16 / 3	PARVINS SUPER MARKET	5041 GENERAL PULLER	UST	107 0.020 NNE

Focus Map - 4 - 6051134.2s

Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

MAPPED SITES SUMMARY - FOCUS MAP 4

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
2 / 4	VDACS PESTICIDE COLL	5730 GENERAL PULLER	FINDS, ECHO	TP
7 / 4	MEHERRIN AG & CHEMIC	5730 GENERAL PULLER	TIER 2	67 0.013 NE

Focus Map - 5 - 6051134.2s

- Sites
- Target Property
- Search Buffer
- Focus Map - No Sites
- Focus Map - Sites
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA

SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

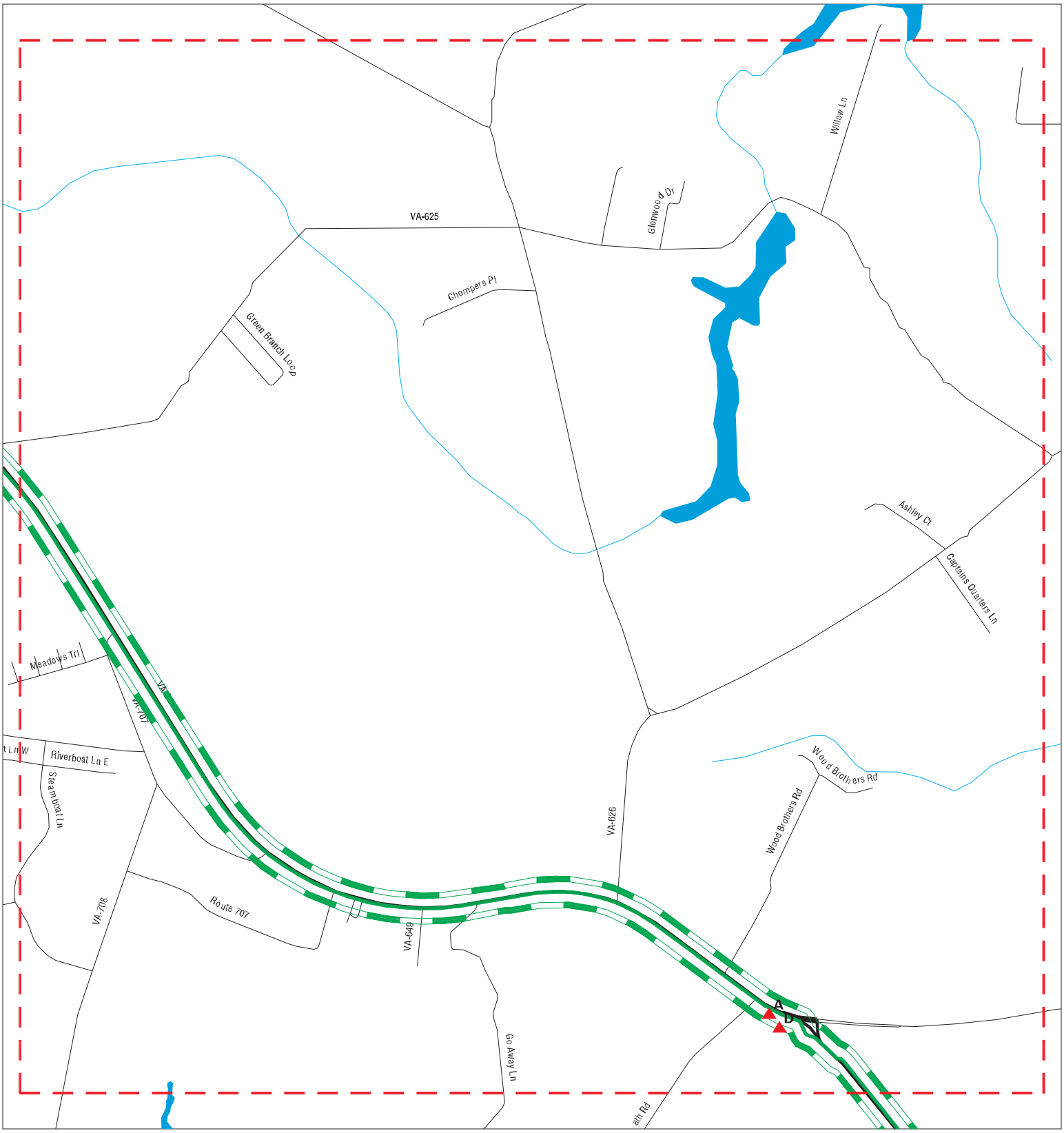
MAPPED SITES SUMMARY - FOCUS MAP 5

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 6 - 6051134.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

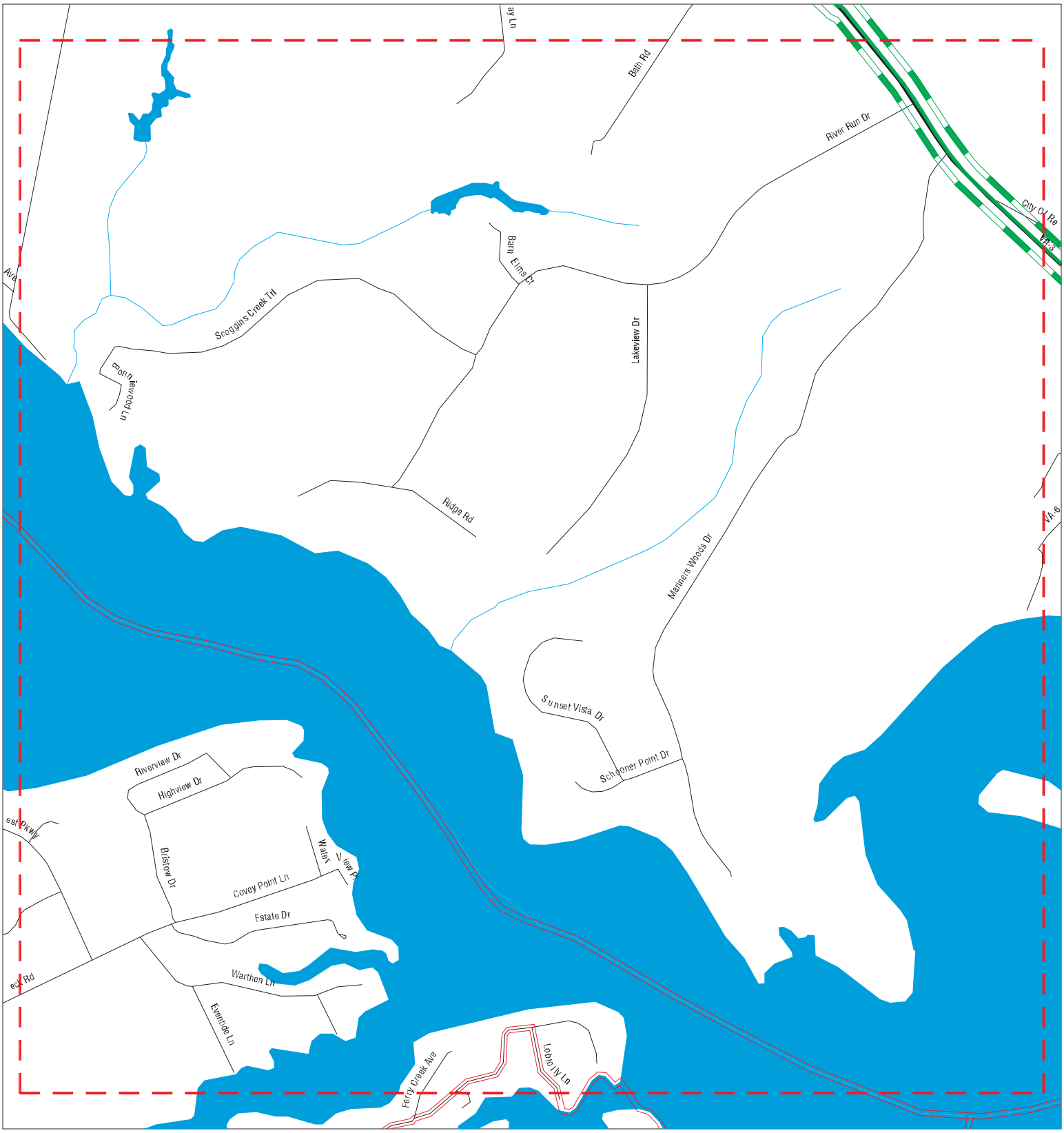
SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

MAPPED SITES SUMMARY - FOCUS MAP 6

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
A3 / 6	LITTLE SUE 136	11102 GENERAL PULLER	RGA LUST	TP
A4 / 6	7 ELEVEN INCORPORATE	11102 GENERAL PULLER	UST, Financial Assurance	TP
A5 / 6	7 ELEVEN INCORPORATE	11102 GENERAL PULLER	LUST, LTANKS	TP
A6 / 6	7 ELEVEN INCORPORATE	11102 GENERAL PULLER	RGA LUST	TP
D17 / 6	REVERE GAS, INC.	11128 GENERAL PULLER	TIER 2	143 0.027 SSW
D18 / 6	REVERE GAS & APPLIAN	11128 GENERAL PULLER	TIER 2	143 0.027 SSW

Focus Map - 7 - 6051134.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE III	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

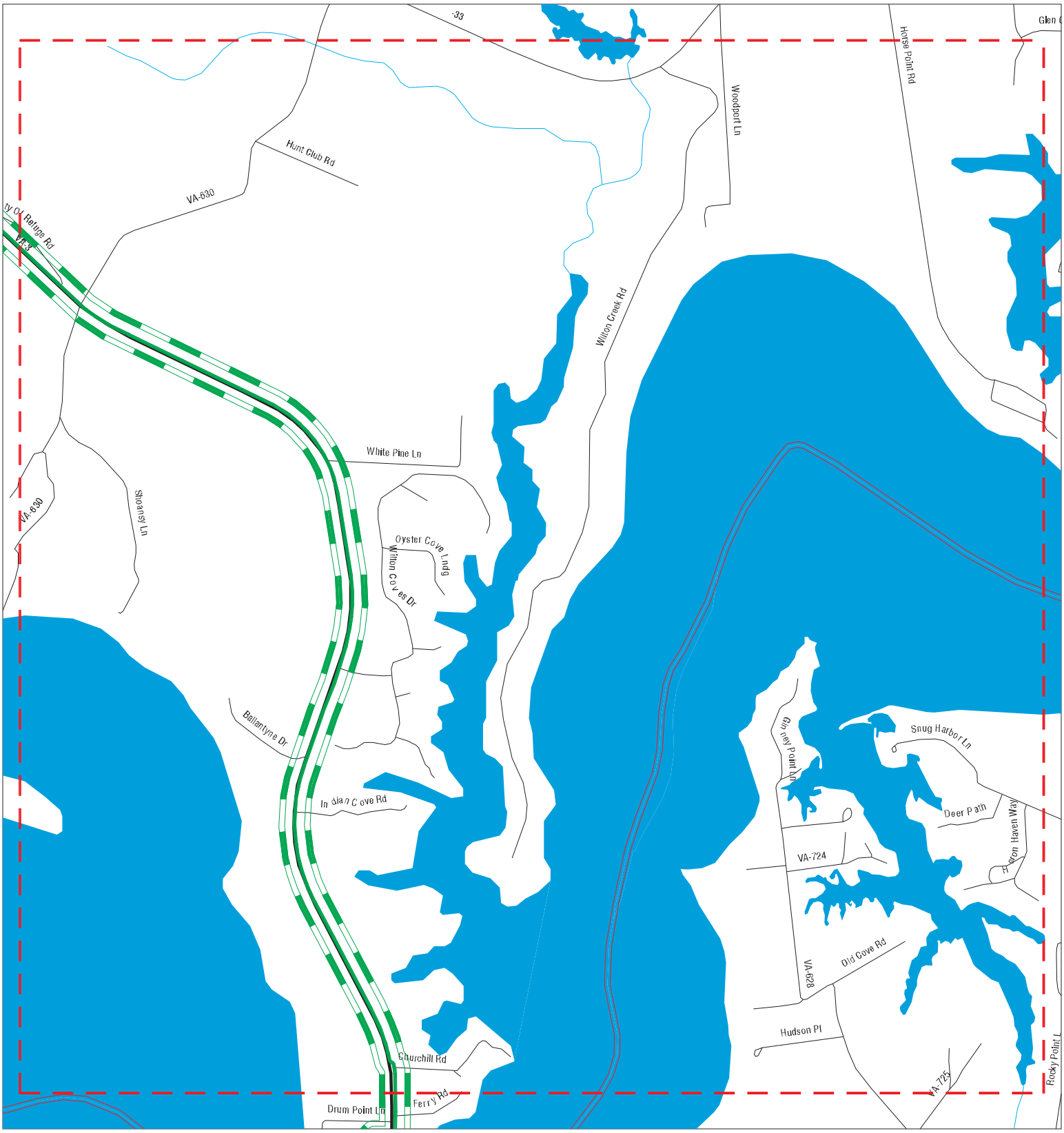
MAPPED SITES SUMMARY - FOCUS MAP 7

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 8 - 6051134.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

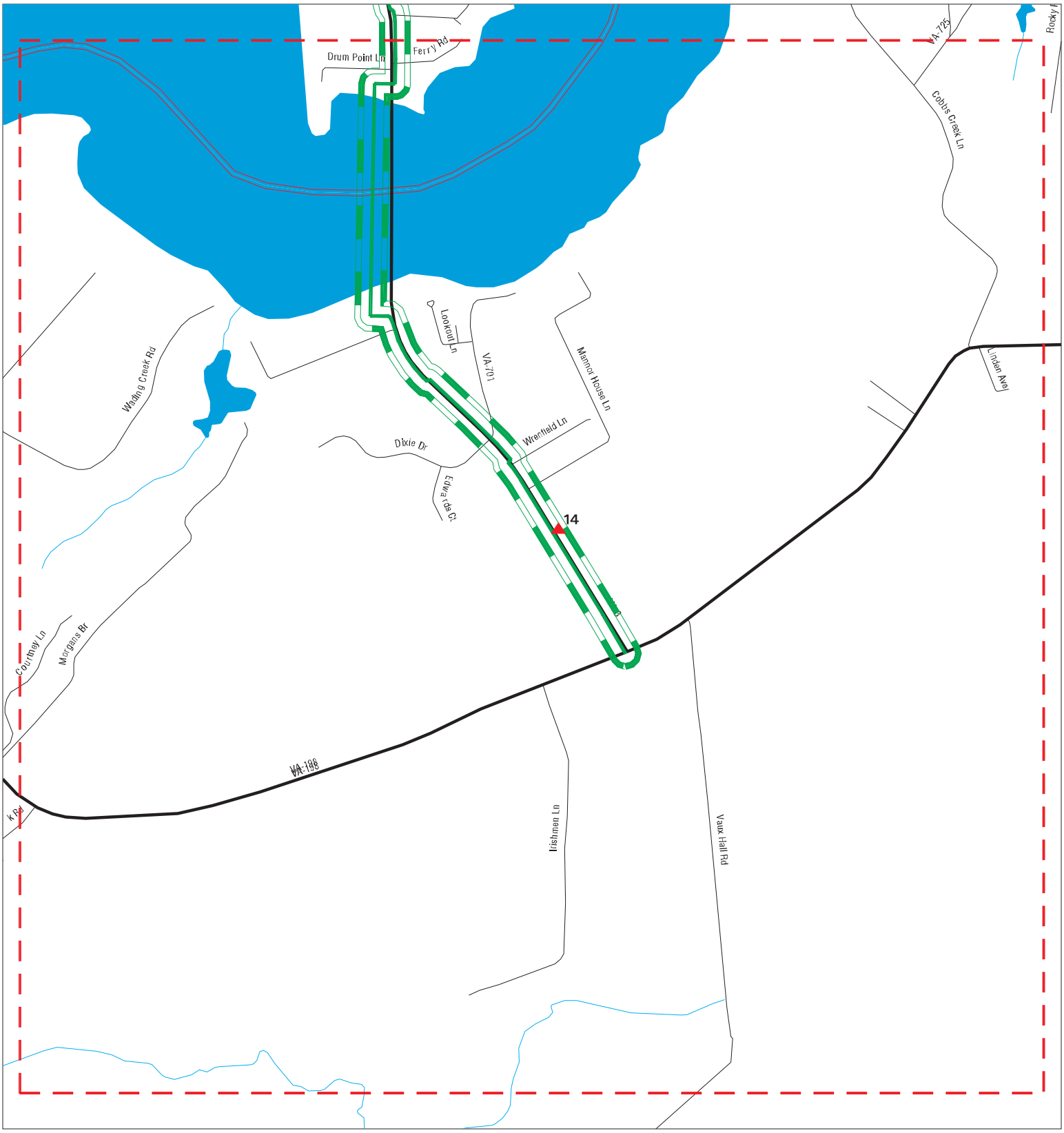
MAPPED SITES SUMMARY - FOCUS MAP 8

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION

NO MAPPED SITES FOUND

Focus Map - 9 - 6051134.2s



Sites
Target Property
Search Buffer
Focus Map - No Sites
Focus Map - Sites
National Priority List Sites
Dept. Defense Sites
Indian Reservations BIA

0 1/4 1/2 Miles

SITE NAME: MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II	CLIENT: Tetra Tech
ADDRESS: URBANNA TO MATHEWS TRANSMISSION FORCE MAIN	CONTACT: Emily Foster
CITY/STATE: Urbanna VA	INQUIRY #: 6051134.2s
ZIP: 23175	DATE: 04/28/20

MAPPED SITES SUMMARY - FOCUS MAP 9

Target Property:
URBANNA TO MATHEWS TRANSMISSION FORCE MAIN
URBANNA, VA 23175

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
14 / 9		52 TWIGGS FERRY ROAD	SPILLS	82 0.016 ENE

1 **XCELPLUS INTERNATIONAL** **ICIS** **1009331987**
Target **5041 GENERAL PULLER HIGHWAY** **FINDS** **N/A**
Property **SALUDA, VA 23149**

Actual: **76 ft.**

Focus Map: 3

ICIS:

Enforcement Action ID:	03-100022540
FRS ID:	110024538598
Action Name:	FIFRA - Xcelplus International
Facility Name:	XCELPLUS INTERNATIONAL
Facility Address:	5041 GENERAL PULLER HIGHWAY SALUDA, VA 23149
Enforcement Action Type:	Letter to Regulated Entity
Facility County:	MIDDLESEX
Program System Acronym:	ICIS
Enforcement Action Forum Desc:	Administrative - Informal
EA Type Code:	LRE
Facility SIC Code:	Not reported
Federal Facility ID:	Not reported
Latitude in Decimal Degrees:	37.60129
Longitude in Decimal Degrees:	-76.51742
Permit Type Desc:	Not reported
Program System Acronym:	7825695
Facility NAICS Code:	Not reported
Tribal Land Code:	Not reported

FINDS:

Registry ID:	110024538598
Facility URL:	http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110024538598

Environmental Interest/Information System:
ICIS (Integrated Compliance Information System) is the Integrated Compliance Information System and provides a database that, when complete, will contain integrated Enforcement and Compliance information across most of EPA's programs. The vision for ICIS is to replace EPA's independent databases that contain Enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions. This information is maintained in ICIS by EPA in the Regional offices and it Headquarters. A future release of ICIS will replace the Permit Compliance System (PCS) which supports the NPDES and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities occurring in the Region that support Compliance and Enforcement programs. These include; Incident Tracking, Compliance Assistance, and Compliance Monitoring.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

---

2 **VDACS PESTICIDE COLLECTION PROGRAM / MEHERRIN AG &** **FINDS** **1018363038**
Target **5730 GENERAL PULLER HIGHWAY** **ECHO** **N/A**
Property **LOCUST HILL, VA 23092**

Actual: **83 ft.**

Focus Map: 4

FINDS:

Registry ID:	110067265248
Facility URL:	http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110067265248

Environmental Interest/Information System:
RCRAInfo is a national information system that supports the Resource

VDACS PESTICIDE COLLECTION PROGRAM / MEHERRIN AG & CHEMICAL (Continued) **1018363038**

Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1018363038
Registry ID:	110067265248
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110067265248
Name:	VDACS PESTICIDE COLLECTION PROGRAM / MEHERRIN AG & CHEMICAL
Address:	5730 GENERAL PULLER HIGHWAY
City,State,Zip:	LOCUST HILL, VA 23092

A3 **LITTLE SUE 136** **RGA LUST** **S115975373**
Target **11102 GENERAL PULLER BLVD** **N/A**
Property **HARTFIELD, VA**

Site 1 of 4 in cluster A

Actual: **78 ft.**
Focus Map: **6**

RGA LUST:

2012	LITTLE SUE 136	11102 GENERAL PULLER BLVD
2011	LITTLE SUE 136	11102 GENERAL PULLER BLVD
2010	LITTLE SUE 136	11102 GENERAL PULLER BLVD
2009	LITTLE SUE 136	11102 GENERAL PULLER BLVD
2008	LITTLE SUE 136	11102 GENERAL PULLER BLVD

A4 **7 ELEVEN INCORPORATED 34062** **UST** **U003686646**
Target **11102 GENERAL PULLER BLVD** **Financial Assurance** **N/A**
Property **HARTFIELD, VA 23071**

Site 2 of 4 in cluster A

Actual: **78 ft.**
Focus Map: **6**

Facility:

Name:	7 ELEVEN INCORPORATED 34062
Address:	11102 GENERAL PULLER BLVD
City,State,Zip:	HARTFIELD, VA 23071
Facility Id:	4018362
Facility Type:	GAS STATION
CEDS Facility ID:	200000165442

Owner:

Owner Id:	38838
Owner Name:	7 Eleven Incorporated
Owner Address:	PO Box 711 (Attn: Gasoline Compliance)
Owner Address2:	Not reported
Owner City, State, Zip:	Dallas, TX 75221
Owner Type:	COMMERCIAL
Number of Active AST:	0
Number of Active UST:	3
Number of Inactive AST:	0
Number of Inactive UST:	5

Owner Id:	28628
Owner Name:	H.L. REVERE

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Owner Address:	BOX 100
Owner Address2:	MIDDLESEX
Owner City, State, Zip:	HARTFIELD, VA 23071
Owner Type:	COMMERCIAL
Number of Active AST:	0
Number of Active UST:	3
Number of Inactive AST:	0
Number of Inactive UST:	5

UST:

Facility ID:	4018362
Federally Regulated:	Yes
Tank Number:	1
Tank Capacity:	6000
Tank Contents:	GASOLINE
Tank Status:	**CURR IN USE**
Tank Type:	UST

Tank Material:

Install Date:	1/1/1990
Tank Materials: Bare Steel	No
Tank Materials: Cath Protect Steel	Yes
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	Yes
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	Yes
Tank Release Detection: Overfill Install	Not reported
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	Yes
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported
Pipe Type:	PRESSURE
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	No
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	Yes
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported
Facility ID:	4018362
Federally Regulated:	Yes
Tank Number:	2
Tank Capacity:	6000
Tank Contents:	GASOLINE
Tank Status:	**CURR IN USE**
Tank Type:	UST

Tank Material:

Install Date:	1/1/1990
Tank Materials: Bare Steel	No
Tank Materials: Cath Protect Steel	Yes
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	Yes
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	Yes
Tank Release Detection: Overfill Install	Not reported
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	Yes
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported

Pipe Type:	PRESSURE
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	No
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	Yes
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

Facility ID:	4018362
Federally Regulated:	Yes

Tank Number:	3
Tank Capacity:	6000
Tank Contents:	GASOLINE
Tank Status:	**CURR IN USE**
Tank Type:	UST

Tank Material:

Install Date:	1/1/1987
Tank Materials: Bare Steel	No
Tank Materials: Cath Protect Steel	Yes
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	Yes
Tank Release Detection:Tank Tightness	No

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	Yes
Tank Release Detection: Overfill Install	Not reported
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	Yes
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported

Pipe Type:	PRESSURE
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	No
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	Yes
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

Facility ID:	4018362
Federally Regulated:	Yes

Tank Number:	G5
Tank Capacity:	550
Tank Contents:	KEROSENE
Tank Status:	**CLS IN GRD**
Tank Type:	UST

Tank Material:

Install Date:	5/8/1960
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Tank Materials: Other Note	Not reported
Release Detection:	
Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported
Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported
Facility ID:	4018362
Federally Regulated:	Yes
Tank Number:	R1
Tank Capacity:	4000
Tank Contents:	GASOLINE
Tank Status:	**REM FROM GRD**
Tank Type:	UST
Tank Material:	
Install Date:	5/8/1960
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported

Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

Facility ID:	4018362
Federally Regulated:	Yes

Tank Number:	R2
Tank Capacity:	3000
Tank Contents:	GASOLINE
Tank Status:	**REM FROM GRD**
Tank Type:	UST

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Tank Material:

Install Date:	5/8/1960
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported

Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Facility ID:	4018362
Federally Regulated:	Yes
Tank Number:	R3
Tank Capacity:	2000
Tank Contents:	GASOLINE
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	5/8/1960
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported
Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported
Facility ID:	4018362
Federally Regulated:	Yes
Tank Number:	R4
Tank Capacity:	2000
Tank Contents:	GASOLINE
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	5/8/1960
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Pipe Release Detection: Other Note	Not reported
Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

VA Financial Assurance 1:

Name:	7 ELEVEN INCORPORATED 34062
Address:	11102 GENERAL PULLER BLVD
Address 2:	Not reported
City,State,Zip:	HARTFIELD, VA 23071
Facility ID:	4018362
Owner Name:	7 Eleven Incorporated
ROF Own Id:	38838
Tank Type:	UST
Mechanism:	Insurance
Gallonage:	Not reported
Per Occurence:	1000000
Third Party:	1000000
Annual Aggregate:	2000000
In Compliance:	Not reported
Total Capacity:	6000
CEDS Facility Name:	7 Eleven Incorporated 34062
Tank Status:	CURR IN USE
Active Federally Regualted UST:	Y

Name:	7 ELEVEN INCORPORATED 34062
Address:	11102 GENERAL PULLER BLVD
Address 2:	Not reported
City,State,Zip:	HARTFIELD, VA 23071
Facility ID:	4018362
Owner Name:	7 Eleven Incorporated
ROF Own Id:	38838
Tank Type:	UST
Mechanism:	Insurance
Gallonage:	Not reported
Per Occurence:	1000000
Third Party:	1000000
Annual Aggregate:	2000000
In Compliance:	Not reported
Total Capacity:	6000
CEDS Facility Name:	7 Eleven Incorporated 34062
Tank Status:	CURR IN USE
Active Federally Regualted UST:	Y

Name:	7 ELEVEN INCORPORATED 34062
Address:	11102 GENERAL PULLER BLVD

7 ELEVEN INCORPORATED 34062 (Continued) **U003686646**

Address 2:	Not reported
City,State,Zip:	HARTFIELD, VA 23071
Facility ID:	4018362
Owner Name:	7 Eleven Incorporated
ROF Own Id:	38838
Tank Type:	UST
Mechanism:	Insurance
Gallonage:	Not reported
Per Occurence:	1000000
Third Party:	1000000
Annual Aggregate:	2000000
In Compliance:	Not reported
Total Capacity:	6000
CEDS Facility Name:	7 Eleven Incorporated 34062
Tank Status:	CURR IN USE
Active Federally Regualted UST:	Y

A5 **7 ELEVEN INCORPORATED 34062** **LUST S108968362**
Target **11102 GENERAL PULLER BLVD** **LTANKS N/A**
Property **HARTFIELD, VA 23071**

Site 3 of 4 in cluster A

Actual:
78 ft.

Focus Map:
6

LUST REG PD:

Region:	PD
Status:	**Closed**
Pollution Complaint #:	20114166
Reg Code:	PRO

Region:	PD
Status:	**Closed**
Pollution Complaint #:	20114147
Reg Code:	PRO

Region:	PD
Status:	**Closed**
Pollution Complaint #:	20084342
Reg Code:	PRO

LTANKS:

Name:	7 ELEVEN INCORPORATED 34062
Address:	11102 GENERAL PULLER BLVD
City,State,Zip:	HARTFIELD, VA 23071
City,State,Zip:	HARTFIELD, VA 23071
Region:	PRO
CEDS Facility Id:	200000165442
Case Status:	**Closed**
Pollution Complaint #:	20114166
Reported:	10/18/2010
Case Closed Date:	10/18/2010
Program:	RP Lead
Federally Regulated UST (Y/N):	Y
Regulated Petroleum UST (1):	Y
Excluded UST (1):	N
Deferred UST (1):	N
Partially Deferred UST (1):	N
Exempt 1 UST (2):	N

7 ELEVEN INCORPORATED 34062 (Continued) **S108968362**

Exempt 2 Heating Oil UST (2):	N
Small Heating Oil AST (2):	N
Regulated AST (3):	N
Unregulated AST (3):	N
Other Y/N:	N
Unknown Y/N:	N
Other Description:	Not reported
Heating Oil Category:	Not reported

Name:	7 ELEVEN INCORPORATED 34062
Address:	11102 GENERAL PULLER BLVD
City,State,Zip:	HARTFIELD, VA 23071
City,State,Zip:	HARTFIELD, VA 23071
Region:	PRO
CEDS Facility Id:	200000165442
Case Status:	**Closed**
Pollution Complaint #:	20114147
Reported:	10/11/2010
Case Closed Date:	01/28/2011
Program:	RP Lead
Federally Regulated UST (Y/N):	N
Regulated Petroleum UST (1):	N
Excluded UST (1):	N
Deferred UST (1):	N
Partially Deferred UST (1):	N
Exempt 1 UST (2):	N
Exempt 2 Heating Oil UST (2):	N
Small Heating Oil AST (2):	N
Regulated AST (3):	N
Unregulated AST (3):	Y
Other Y/N:	N
Unknown Y/N:	N
Other Description:	Not reported
Heating Oil Category:	Not reported

Name:	LITTLE SUE 136
Address:	11102 GENERAL PULLER BLVD
City,State,Zip:	HARTFIELD, VA 23071
City,State,Zip:	HARTFIELD, VA 23071
Region:	PRO
CEDS Facility Id:	200000165442
Case Status:	**Closed**
Pollution Complaint #:	20084342
Reported:	11/21/2007
Case Closed Date:	12/17/2007
Program:	RP Lead
Federally Regulated UST (Y/N):	Y
Regulated Petroleum UST (1):	Y
Excluded UST (1):	N
Deferred UST (1):	N
Partially Deferred UST (1):	N
Exempt 1 UST (2):	N
Exempt 2 Heating Oil UST (2):	N
Small Heating Oil AST (2):	N
Regulated AST (3):	N
Unregulated AST (3):	N
Other Y/N:	N

7 ELEVEN INCORPORATED 34062 (Continued) **S108968362**

Unknown Y/N: N
Other Description: Not reported
Heating Oil Category: Not reported

A6
Target
Property

7 ELEVEN INCORPORATED 34062
11102 GENERAL PULLER BLVD
HARTFIELD, VA

RGA LUST **S115951760**
N/A

Site 4 of 4 in cluster A

Actual:
78 ft.

Focus Map:
6

RGA LUST:

2012	7 ELEVEN INCORPORATED 34062	11102 GENERAL PULLER BLVD
2011	7 ELEVEN INCORPORATED 34062	11102 GENERAL PULLER BLVD
2010	7 ELEVEN INCORPORATED 34062	11102 GENERAL PULLER BLVD

7
NE
< 1/8
0.013 mi.
67 ft.

MEHERRIN AG & CHEMICAL CO - LOCUST HILL
5730 GENERAL PULLER HWY
LOCUST HILL, VA 23092

TIER 2 **S118192727**
N/A

Actual:
80 ft.

Focus Map:
4

TIER 2:

Facility ID: Not reported
CAS Number: 7783188
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: AMMONIUM THIOSULFATE
Average Amt Code: 39243.0
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

Facility ID: Not reported
CAS Number: 7783280
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: DIAMMONIUM PHOSPHATE
Average Amt Code: 97965.0
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

Facility ID: Not reported
CAS Number: 38641940
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: Glyphosphate
Average Amt Code: 7191.0
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

MEHERRIN AG & CHEMICAL CO - LOCUST HILL (Continued) **S118192727**

Facility ID:	Not reported
CAS Number:	7447407
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	MURIATE OF POTASH
Average Amt Code:	149674.0
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	1910425
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	PARAQUAT DICHLORIDE
Average Amt Code:	1231.0
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	15978775
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	UREA AMMONIUM NITRATE SOLUTION
Average Amt Code:	123000.0
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	7783202
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	AMMONIUM SULFATE
Average Amt Code:	63651.0
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported

B8 **THRIFT OIL COMPANY** **UST U003988870**
SSE **2742 GENERAL PULLER HWY** **AST N/A**
< 1/8 **SALUDA, VA 23149**
0.014 mi.
75 ft. **Site 1 of 6 in cluster B**

Actual:
90 ft.

Focus Map:
2

Facility:

Name:	THRIFT OIL COMPANY
Address:	2742 GENERAL PULLER HWY
City,State,Zip:	SALUDA, VA 23149
Facility Id:	4012594
Facility Type:	PETROLEUM DISTRIBUTOR
CEDS Facility ID:	200000159612

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy

THRIFT OIL COMPANY (Continued) **U003988870**

Owner Address2:	Not reported
Owner City, State, Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

UST:

Facility ID:	4012594
Federally Regulated:	Yes
Tank Number:	R1
Tank Capacity:	2000
Tank Contents:	DIESEL
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	9/6/1969
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No

THRIFT OIL COMPANY (Continued) **U003988870**

Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported
Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported
Facility ID:	4012594
Federally Regulated:	Yes
Tank Number:	R2
Tank Capacity:	550
Tank Contents:	GASOLINE
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	9/6/1969
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported

Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

AST:

Facility ID:	4012594
Facility Type:	PETROLEUM DISTRIBUTOR
CEDS Facility ID:	200000159612

Tank Info:

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	1
Tank Type:	AST
Tank Capacity:	15120
Tank Contents:	DIESEL
Tank Status:	CLOSED IN PLACE

Tank Containment:

Install Date:	9/30/1962
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No

THRIFT OIL COMPANY (Continued) **U003988870**

Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported
Release Detection:	
Release Detection: Ground Water	No
Release Detection: Visual	No
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	Yes
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported
Tank Material:	
Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	10
Tank Type:	AST
Tank Capacity:	15120
Tank Contents:	FUEL OIL
Tank Status:	CLOSED IN PLACE

Tank Containment:

Install Date:	10/30/1974
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	No
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	No
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	Yes
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	Yes
Release Prevention: Other Note	Not reported

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	11
Tank Type:	AST
Tank Capacity:	15120
Tank Contents:	DIESEL

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Status:	CLOSED IN PLACE
Tank Containment:	
Install Date:	1/1/1965
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported
Release Detection:	
Release Detection: Ground Water	No
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	Yes
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported
Tank Material:	
Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	12
Tank Type:	AST
Tank Capacity:	15000
Tank Contents:	GASOLINE
Tank Status:	CURR IN USE

Tank Containment:

Install Date:	11/17/2011
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	Yes
Release Prevention: Double Walled	No

THRIFT OIL COMPANY (Continued) **U003988870**

Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	Yes
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0

THRIFT OIL COMPANY (Continued) **U003988870**

Number of Inactive AST:	17
Number of Inactive UST:	2
Fed Regulated:	No
Tank Number:	13
Tank Type:	AST
Tank Capacity:	4000
Tank Contents:	DIESEL
Tank Status:	CLOSED IN PLACE

Tank Containment:

Install Date:	9/30/1962
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	No
Release Detection: Visual	Yes
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	Yes
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	Yes
Tank Foundation: Earthen	No
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	Yes
Tank Roof: Other Note	Horizontal

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	Yes
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	17
Tank Type:	AST
Tank Capacity:	10000
Tank Contents:	GASOLINE
Tank Status:	CLOSED IN PLACE

Tank Containment:

Install Date:	9/30/1987
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	No

THRIFT OIL COMPANY (Continued) **U003988870**

Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	Yes
Release Prevention: Other Note	Not reported

Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

THRIFT OIL COMPANY (Continued) **U003988870**

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2
Fed Regulated:	No
Tank Number:	18
Tank Type:	AST
Tank Capacity:	10000
Tank Contents:	GASOLINE
Tank Status:	CLOSED IN PLACE

Tank Containment:

Install Date:	9/30/1987
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	No
Release Detection: Visual	No
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	Yes
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	Yes
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	19
Tank Type:	AST
Tank Capacity:	10000
Tank Contents:	GASOLINE
Tank Status:	CLOSED IN PLACE

Tank Containment:

Install Date:	9/30/1987
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No

THRIFT OIL COMPANY (Continued) **U003988870**

Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported
Release Detection:	
Release Detection: Ground Water	No
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	Yes
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	Yes
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported
Tank Material:	
Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	2
Tank Type:	AST
Tank Capacity:	15000
Tank Contents:	GASOLINE
Tank Status:	CURR IN USE

Tank Containment:

Install Date:	11/1/2017
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	Yes
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	3
Tank Type:	AST
Tank Capacity:	15000
Tank Contents:	DIESEL

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Status:	CURR IN USE
Tank Containment:	
Install Date:	11/1/2017
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	No
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported
Release Detection:	
Release Detection: Ground Water	No
Release Detection: Visual	No
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	No
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported
Tank Material:	
Tank Materials: Bare Steel	No
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	4
Tank Type:	AST
Tank Capacity:	10000
Tank Contents:	KEROSENE
Tank Status:	CURR IN USE

Tank Containment:

Install Date:	11/1/2017
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	Yes
Release Prevention: Double Walled	No

THRIFT OIL COMPANY (Continued) **U003988870**

Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0

THRIFT OIL COMPANY (Continued) **U003988870**

Number of Inactive AST:	17
Number of Inactive UST:	2
Fed Regulated:	No
Tank Number:	6
Tank Type:	AST
Tank Capacity:	15000
Tank Contents:	DIESEL
Tank Status:	CURR IN USE

Tank Containment:

Install Date:	11/1/2017
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	Yes
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	7
Tank Type:	AST
Tank Capacity:	15120
Tank Contents:	KEROSENE
Tank Status:	CLOSED IN PLACE

Tank Containment:

Install Date:	1/1/1965
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	No

THRIFT OIL COMPANY (Continued) **U003988870**

Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	Yes
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported

Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

THRIFT OIL COMPANY (Continued) **U003988870**

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2
Fed Regulated:	No
Tank Number:	8
Tank Type:	AST
Tank Capacity:	15120
Tank Contents:	DIESEL
Tank Status:	CLOSED IN PLACE

Tank Containment:

Install Date:	1/1/1965
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	No
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	No
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	Yes
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	9
Tank Type:	AST
Tank Capacity:	15120
Tank Contents:	HEATING OIL
Tank Status:	DISMANTLED

Tank Containment:

Install Date:	10/30/1974
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No

THRIFT OIL COMPANY (Continued) **U003988870**

Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported
Release Detection:	
Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	Yes
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	Yes
Release Prevention: Other Note	Ultrasonic Testing 9-5-97
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	Yes
Tank Roof: Other Note	Fixed Cone
Tank Material:	
Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Riveted; Painted
Tank Type Cathodic/CP:	Y
Tank Type Single Wall:	Y
Tank Type Double Wall:	Y
Tank Type Lined Interior:	Y
Tank Type Double Bottom:	Y
Tank Type Potable/Skid:	Y
Tank Type Shop Fabricated/Built:	Y
Tank Type Vaulted Below Grade:	Y

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Type Vertical:	Y
Tank Type Horizontal:	Y
Tank Type Unknown:	Y
Tank Type Other:	Y
Tank Type Other Specify:	Y

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	Old 12
Tank Type:	AST
Tank Capacity:	15120
Tank Contents:	HEATING OIL
Tank Status:	DISMANTLED

Tank Containment:

Install Date:	10/30/1974
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	Yes
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	No
Release Prevention: Unknown	No
Release Prevention: Other	Yes
Release Prevention: Other Note	Ultrasonic Testing 9-5-97

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	Yes
Tank Roof: Other Note	Fixed Cone

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Riveted; Painted
Tank Type Cathodic/CP:	Y
Tank Type Single Wall:	Y
Tank Type Double Wall:	Y
Tank Type Lined Interior:	Y
Tank Type Double Bottom:	Y
Tank Type Potable/Skid:	Y
Tank Type Shop Fabricated/Built:	Y
Tank Type Vaulted Below Grade:	Y
Tank Type Vertical:	Y
Tank Type Horizontal:	Y
Tank Type Unknown:	Y
Tank Type Other:	Y
Tank Type Other Specify:	Y

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	R14
Tank Type:	AST
Tank Capacity:	1000
Tank Contents:	KEROSENE

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Status:	DISMANTLED
Tank Containment:	
Install Date:	9/30/1988
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported
Release Detection:	
Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	No
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	Yes
Tank Roof: Other Note	Horizontal Tank
Tank Material:	
Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Painted

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Type Cathodic/CP:	N
Tank Type Single Wall:	N
Tank Type Double Wall:	N
Tank Type Lined Interior:	N
Tank Type Double Bottom:	N
Tank Type Potable/Skid:	N
Tank Type Shop Fabricated/Built:	N
Tank Type Vaulted Below Grade:	N
Tank Type Vertical:	N
Tank Type Horizontal:	N
Tank Type Unknown:	N
Tank Type Other:	N
Tank Type Other Specify:	N

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	R2
Tank Type:	AST
Tank Capacity:	18841
Tank Contents:	GASOLINE
Tank Status:	DISMANTLED

Tank Containment:

Install Date:	10/30/1956
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No

THRIFT OIL COMPANY (Continued) **U003988870**

Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Riveted; Painted
Tank Type Cathodic/CP:	Y
Tank Type Single Wall:	Y
Tank Type Double Wall:	Y
Tank Type Lined Interior:	Y
Tank Type Double Bottom:	Y
Tank Type Potable/Skid:	Y
Tank Type Shop Fabricated/Built:	Y
Tank Type Vaulted Below Grade:	Y
Tank Type Vertical:	Y
Tank Type Horizontal:	Y
Tank Type Unknown:	Y
Tank Type Other:	Y
Tank Type Other Specify:	Y

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0

THRIFT OIL COMPANY (Continued) **U003988870**

Number of Inactive AST:	17
Number of Inactive UST:	2
Fed Regulated:	No
Tank Number:	R3
Tank Type:	AST
Tank Capacity:	18841
Tank Contents:	DIESEL
Tank Status:	DISMANTLED

Tank Containment:

Install Date:	10/30/1956
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	Yes
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Riveted; Painted
Tank Type Cathodic/CP:	Y
Tank Type Single Wall:	Y
Tank Type Double Wall:	Y
Tank Type Lined Interior:	Y
Tank Type Double Bottom:	Y
Tank Type Potable/Skid:	Y
Tank Type Shop Fabricated/Built:	Y
Tank Type Vaulted Below Grade:	Y
Tank Type Vertical:	Y
Tank Type Horizontal:	Y
Tank Type Unknown:	Y
Tank Type Other:	Y
Tank Type Other Specify:	Y

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	R4
Tank Type:	AST
Tank Capacity:	9982
Tank Contents:	KEROSENE
Tank Status:	DISMANTLED

Tank Containment:

Install Date:	10/30/1956
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes

THRIFT OIL COMPANY (Continued) **U003988870**

Release Detection: Visual	Yes
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Painted
Tank Type Cathodic/CP:	Y
Tank Type Single Wall:	Y
Tank Type Double Wall:	Y
Tank Type Lined Interior:	Y
Tank Type Double Bottom:	Y
Tank Type Potable/Skid:	Y
Tank Type Shop Fabricated/Built:	Y
Tank Type Vaulted Below Grade:	Y
Tank Type Vertical:	Y
Tank Type Horizontal:	Y
Tank Type Unknown:	Y
Tank Type Other:	Y
Tank Type Other Specify:	Y

Owner:

THRIFT OIL COMPANY (Continued) **U003988870**

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2
Fed Regulated:	No
Tank Number:	R5
Tank Type:	AST
Tank Capacity:	9982
Tank Contents:	GASOLINE
Tank Status:	DISMANTLED

Tank Containment:

Install Date:	10/30/1956
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No
Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported

Release Detection:

Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported

Tank Material:

Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Painted
Tank Type Cathodic/CP:	Y
Tank Type Single Wall:	Y
Tank Type Double Wall:	Y
Tank Type Lined Interior:	Y
Tank Type Double Bottom:	Y
Tank Type Potable/Skid:	Y
Tank Type Shop Fabricated/Built:	Y
Tank Type Vaulted Below Grade:	Y
Tank Type Vertical:	Y
Tank Type Horizontal:	Y
Tank Type Unknown:	Y
Tank Type Other:	Y
Tank Type Other Specify:	Y

Owner:

Owner Id:	27894
Owner Name:	JT & CA Thrift Inc t/a Thrift Oil Company
Owner Address:	2742 General Puller Hwy
Owner Address2:	Not reported
Owner City/State/Zip:	Saluda, VA 23149
Owner Type:	COMMERCIAL
Number of Active AST:	5
Number of Active UST:	0
Number of Inactive AST:	17
Number of Inactive UST:	2

Fed Regulated:	No
Tank Number:	R6
Tank Type:	AST
Tank Capacity:	17640
Tank Contents:	DIESEL
Tank Status:	DISMANTLED

Tank Containment:

Install Date:	9/30/1960
Containment: Curbing	No
Containment: Weirs	No
Containment: Sorbent	No
Containment: Culvert	No

THRIFT OIL COMPANY (Continued) **U003988870**

Containment: Diversion	No
Containment: Retention	No
Containment: Dike	Yes
Containment: Unknown	No
Containment: Other	No
Containment: Other Note	Not reported
Release Detection:	
Release Detection: Ground Water	Yes
Release Detection: Visual	Yes
Release Detection: Vapor	Yes
Release Detection: Interstitial	No
Release Detection: None	No
Release Detection: Other	No
Release Detection: Other Note	Not reported
Release Prevention: Double Bottom	No
Release Prevention: Double Walled	No
Release Prevention: Lined Interior	Not reported
Release Prevention: Poly Jacket	No
Release Prevention: Exc Liner	No
Release Prevention: None	Yes
Release Prevention: Unknown	No
Release Prevention: Other	No
Release Prevention: Other Note	Not reported
Tank Foundation: Steel	No
Tank Foundation: Earthen	Yes
Tank Foundation: Concrete Imp	No
Tank Foundation: Unknown	No
Tank Foundation: Other	No
Tank Foundation: Other Note	Not reported
Tank Roof: Float	No
Tank Roof: Cone	No
Tank Roof: Breather	Not reported
Tank Roof: Dbldeck	Not reported
Tank Roof: Pontoon	Not reported
Tank Roof: Balloon	Not reported
Tank Roof: Lifter	Not reported
Tank Roof: Pan	Not reported
Tank Roof: Other	No
Tank Roof: Other Note	Not reported
Tank Material:	
Tank Materials: Bare Steel	Yes
Tank Materials: Concrete	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Painted
Tank Type Cathodic/CP:	Y
Tank Type Single Wall:	Y
Tank Type Double Wall:	Y
Tank Type Lined Interior:	Y
Tank Type Double Bottom:	Y
Tank Type Potable/Skid:	Y
Tank Type Shop Fabricated/Built:	Y
Tank Type Vaulted Below Grade:	Y

THRIFT OIL COMPANY (Continued) **U003988870**

Tank Type Vertical:	Y
Tank Type Horizontal:	Y
Tank Type Unknown:	Y
Tank Type Other:	Y
Tank Type Other Specify:	Y

B9 **J T THRIFT OIL EXXON** **FINDS** **1008167701**
SSE **2742 GENERAL PULLER HWY** **N/A**
< 1/8 **SALUDA, VA 23149**
0.014 mi.
75 ft. **Site 2 of 6 in cluster B**

Actual: **90 ft.**
Focus Map: 2

FINDS:

Registry ID:	110020672388
Facility URL:	http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110020672388

Environmental Interest/Information System:
CEDS (Virginia - Comprehensive Environmental Data System) is the Department of Environmental Quality's (DEQ) electronic data system for maintaining databases on sources of pollutants in all media.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

B10 **THRIFT OIL** **LUST** **S110068788**
SSE **2742 GENERAL PULLER HWY** **LTANKS** **N/A**
< 1/8 **SALUDA, VA 23149** **TIER 2**
0.014 mi.
75 ft. **Site 3 of 6 in cluster B**

Actual: **90 ft.**
Focus Map: 2

LUST REG PD:

Region:	PD
Status:	**Closed**
Pollution Complaint #:	19984155
Reg Code:	PRO

LTANKS:

Name:	THRIFT OIL
Address:	2742 GENERAL PULLER HWY
City,State,Zip:	SALUDA, VA 23149
City,State,Zip:	SALUDA, VA 23149
Region:	PRO
CEDS Facility Id:	200000159612
Case Status:	**Closed**
Pollution Complaint #:	19984155
Reported:	11/13/1997
Case Closed Date:	01/25/2001
Program:	RP Lead
Federally Regulated UST (Y/N):	N
Regulated Petroleum UST (1):	N
Excluded UST (1):	N
Deferred UST (1):	N
Partially Deferred UST (1):	N
Exempt 1 UST (2):	N

THRIFT OIL (Continued) **S110068788**

Exempt 2 Heating Oil UST (2):	N
Small Heating Oil AST (2):	N
Regulated AST (3):	Y
Unregulated AST (3):	N
Other Y/N:	N
Unknown Y/N:	N
Other Description:	Not reported
Heating Oil Category:	Not reported

TIER 2:

Facility ID:	Not reported
CAS Number:	Not reported
SIC Code:	99999
NAICS:	Not reported
Entered Chemical Name:	MOTOR OIL
Average Amt Code:	3
Owner Name:	THRIFT OIL CO.
Owner Phone:	804-758-2366
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	64742-81-0
SIC Code:	99999
NAICS:	Not reported
Entered Chemical Name:	KEROSENE K-1
Average Amt Code:	4
Owner Name:	THRIFT OIL CO.
Owner Phone:	804-758-2366
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	68334-30-5
SIC Code:	99999
NAICS:	Not reported
Entered Chemical Name:	LOW SULFUR DIESEL
Average Amt Code:	5
Owner Name:	THRIFT OIL CO.
Owner Phone:	804-758-2366
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	86290-81-5
SIC Code:	99999
NAICS:	Not reported
Entered Chemical Name:	GASOLINE-UNLEADED
Average Amt Code:	4
Owner Name:	THRIFT OIL CO.
Owner Phone:	804-758-2366
Contact Type:	Not reported

B11
SSE
< 1/8
0.014 mi.
75 ft.

J T AND C A THRIFT INCORPORATED
2742 GENERAL PULLER HWY
SALUDA, VA 23149

Site 4 of 6 in cluster B

US AIRS
FINDS
ECHO

1004607294
N/A

Actual:
90 ft.

Focus Map:
2

US AIRS MINOR:

Envid:	1004607294
Region Code:	03
Programmatic ID:	AIR VA0000005111900015
Facility Registry ID:	110007319543
D and B Number:	Not reported
Primary SIC Code:	Not reported
NAICS Code:	424710
Default Air Classification Code:	MIN
Facility Type of Ownership Code:	NON
Air CMS Category Code:	Not reported
HPV Status:	Not reported

US AIRS MINOR:

Region Code:	03
Programmatic ID:	AIR VA0000005111900015
Facility Registry ID:	110007319543
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	MACT Standards (40 CFR Part 63)
Activity Date:	2013-02-04 00:00:00
Activity Status Date:	Not reported
Activity Group:	Compliance Monitoring
Activity Type:	Inspection/Evaluation
Activity Status:	Not reported

Region Code:	03
Programmatic ID:	AIR VA0000005111900015
Facility Registry ID:	110007319543
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date:	1992-04-07 00:00:00
Activity Status Date:	Not reported
Activity Group:	Compliance Monitoring
Activity Type:	Inspection/Evaluation
Activity Status:	Not reported

Region Code:	03
Programmatic ID:	AIR VA0000005111900015
Facility Registry ID:	110007319543
Air Operating Status Code:	OPR
Default Air Classification Code:	MIN
Air Program:	State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date:	1997-09-11 00:00:00
Activity Status Date:	Not reported
Activity Group:	Compliance Monitoring
Activity Type:	Inspection/Evaluation
Activity Status:	Not reported

Region Code:	03
Programmatic ID:	AIR VA0000005111900015
Facility Registry ID:	110007319543
Air Operating Status Code:	OPR

J T AND C A THRIFT INCORPORATED (Continued) **1004607294**

Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2010-09-17 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 03
Programmatic ID: AIR VA0000005111900015
Facility Registry ID: 110007319543
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2013-02-04 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

Region Code: 03
Programmatic ID: AIR VA0000005111900015
Facility Registry ID: 110007319543
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2013-02-05 00:00:00
Activity Status Date: Not reported
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation
Activity Status: Not reported

FINDS:
Registry ID: 110007319543
Facility URL: http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110007319543

Environmental Interest/Information System:
AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.
AIR MINOR

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1004607294
Registry ID: 110007319543

J T AND C A THRIFT INCORPORATED (Continued) **1004607294**

DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110007319543
Name: J T AND C A THRIFT INCORPORATED
Address: 2742 GENERAL PULLER HWY
City,State,Zip: SALUDA, VA 23149

B12 **J. T. & C. A. THRIFT, INC. T/A THRIFT OIL CO.** **LTANKS** **S118192560**
SSE **2742 GENERAL PULLER HWY.** **TIER 2** **N/A**
< 1/8 **SALUDA, VA 23149**
0.014 mi.
75 ft. **Site 5 of 6 in cluster B**

Actual:
90 ft.

Focus Map:
2

LTANKS:

Name:	THRIFT OIL COMPANY
Address:	2742 GENERAL PULLER HWY
City,State,Zip:	SALUDA, VA 23149
City,State,Zip:	SALUDA, VA 23149
Region:	PRO
CEDS Facility Id:	200000159612
Case Status:	**Open**
Pollution Complaint #:	20184442
Reported:	06/08/2018
Case Closed Date:	Not reported
Program:	RP Lead
Federally Regulated UST (Y/N):	N
Regulated Petroleum UST (1):	N
Excluded UST (1):	N
Deferred UST (1):	N
Partially Deferred UST (1):	N
Exempt 1 UST (2):	N
Exempt 2 Heating Oil UST (2):	N
Small Heating Oil AST (2):	N
Regulated AST (3):	Y
Unregulated AST (3):	N
Other Y/N:	N
Unknown Y/N:	N
Other Description:	Not reported
Heating Oil Category:	Not reported

TIER 2:

Facility ID:	Not reported
CAS Number:	64742810
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	Kerosene K-1
Average Amt Code:	99999.0
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	8012951
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	Motor Oil
Average Amt Code:	9999.0
Owner Name:	Not reported
Owner Phone:	Not reported

J. T. & C. A. THRIFT, INC. T/A THRIFT OIL CO. (Continued) **S118192560**

Contact Type: Not reported

Facility ID: Not reported
CAS Number: Not reported
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: Ultra Low Sulfur Diesel
Average Amt Code: 999999.0
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

Facility ID: Not reported
CAS Number: 8006619
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: Gasoline
Average Amt Code: 99999.0
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

Facility ID: 5423922
CAS Number: 8012951
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: GEAR OIL
Average Amt Code: 490
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

Facility ID: 5423922
CAS Number: 8012951
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: RONEX GREASE (MULTIPURPOSE)
Average Amt Code: 10
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

Facility ID: 5423922
CAS Number: 8012951
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: MOTOR OIL
Average Amt Code: 150
Owner Name: Not reported
Owner Phone: Not reported
Contact Type: Not reported

Facility ID: 5423922
CAS Number: 8008206
SIC Code: Not reported
NAICS: Not reported
Entered Chemical Name: K-1 KEROSENE

J. T. & C. A. THRIFT, INC. T/A THRIFT OIL CO. (Continued) **S118192560**

Average Amt Code:	28000
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported
Facility ID:	5423922
CAS Number:	68476346
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	ULTRA LOW SULFUR DIESEL
Average Amt Code:	42000
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported
Facility ID:	5423922
CAS Number:	8006619
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	UNLEADED GASOLINE
Average Amt Code:	28000
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported

B13 **THRIFT OIL** **RGA LUST** **S115990325**
SSE **2742 GENERAL PULLER HWY** **N/A**
< 1/8 **SALUDA, VA**
0.014 mi.
75 ft. **Site 6 of 6 in cluster B**

Actual: **90 ft.**
Focus Map: **2**

RGA LUST:

2012	THRIFT OIL	2742 GENERAL PULLER HWY
2011	THRIFT OIL	2742 GENERAL PULLER HWY
2010	THRIFT OIL	2742 GENERAL PULLER HWY
2009	THRIFT OIL	2742 GENERAL PULLER HWY
2008	THRIFT OIL	2742 GENERAL PULLER HWY
2007	THRIFT OIL	2742 GENERAL PULLER HWY
2006	THRIFT OIL	2742 GENERAL PULLER HWY
2005	THRIFT OIL	2742 GENERAL PULLER HWY

---

14 **SPILLS** **S117881835**
ENE **52 TWIGGS FERRY ROAD, MATHEWS COUNTY, DUTTON VIRGINIA 23050** **N/A**
< 1/8 **MATHEWS, VA 23050**
0.016 mi.
82 ft.

Actual: **39 ft.**
Focus Map: **9**

SPILLS:

Name:	Not reported
Address:	52 TWIGGS FERRY ROAD, MATHEWS COUNTY, DUTTON VIRGINIA 23050
City,State,Zip:	MATHEWS, VA 23050
City,State,Zip:	MATHEWS, VA 23050
Fips City/County:	115/Mathews County
Status:	Closed
Reference Id:	34274
IR Number:	2015-P-2392
Associated IR:	Not reported

(Continued) **S117881835**

Incident Date:	08/16/2015
Call Received Date:	04/16/2015
Closure Comments:	Not reported
Threat To:	Not reported
Terrorism (Y/N):	N
Characterize Incident:	Unknown
Incident Type:	Not reported
Incident Subtype:	Not reported
Materials:	Not reported
Effect To Receptor:	Not reported
Water Body:	Not reported
Low Quantity To Water:	Not reported
High Quantity To Water:	Not reported
Quantity Units:	Not reported
Other Receptors:	Not reported
RP Company:	Not reported
RP Name:	Not reported
Property Owner:	Not reported
Property Company:	Not reported
Duration Of Event (Hrs):	0
Impacts:	Not reported
Other Impacts:	Not reported
Steps Taken:	Not reported
Steps Taken Description:	Not reported
System Components:	Not reported
Other System Components:	Not reported
Cause Of Event:	Not reported
Corrective Action Taken:	Not reported
Weather Status:	No
Precipitation (Wet):	0
Discharge Type:	Not reported
Discharge Volume:	0
Unknown Discharge (Y/N):	N
Site Name:	52 TWIGGS FERRY ROAD, MATHEWS COUNTY, DUTTON VIRGINIA 23050
Closure Date:	07/11/2018
Orig. Call Incident Description:	Complaint that RP has jerry rigged gasoline and diesel tanks, used to own a petroleum company. Complainant states that runoff from the tanks may have killed one of her trees and she is worried about her drinking water.
Original Call Material Description:	Not reported
Original Call Location Description:	52 Twiggs Ferry Road, Mathews County, Dutton Virginia 23050
Incident Ongoing at time of Call:	No
Agencies Notified (Y/N):	Not reported
Other Agencies:	Not reported
Permitted (Y/N):	No
Call Reported By Company Name:	Not reported
Call Property Owner Company Name:	Not reported
Call Property Owner Name:	Tim Cox
Site Summary:	Complaint that RP has jerry rigged gasoline and diesel tanks, used to own a petroleum company. Complainant states that runoff from the tanks may have killed one of her trees and she is worried about her drinking water.

C15 **GOODGIRL INDUSTRIES** **FINDS** **1024417095**
NNE **5041 GENERAL PULLER HIGHWAY** **N/A**
< 1/8 **LOCUST HILL, VA 23092**
0.020 mi.
107 ft. **Site 1 of 2 in cluster C**

Actual:
79 ft.

Focus Map:
3

FINDS:
Registry ID: 110070334863
Facility URL: http://ofmpub.epa.gov/enviro/fii_query_detail.disp_program_facility?p_registry_id=110070334863

Environmental Interest/Information System:
OSHA ESTABLISHMENT

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

C16 **PARVINS SUPER MARKET (FORMER)** **UST** **U003683203**
NNE **5041 GENERAL PULLER HWY** **N/A**
< 1/8 **LOCUST HILL, VA 23092**
0.020 mi.
107 ft. **Site 2 of 2 in cluster C**

Actual:
79 ft.

Focus Map:
3

Facility:
Name: PARVINS SUPER MARKET (FORMER)
Address: 5041 GENERAL PULLER HWY
City,State,Zip: LOCUST HILL, VA 23092
Facility Id: 4002797
Facility Type: GAS STATION
CEDS Facility ID: 200000168116

Owner:
Owner Id: 26833
Owner Name: TC Treakle and JA Christopher Inc
Owner Address: PO Box 339
Owner Address2: 37 Seafood Ln
Owner City, State, Zip: Irvington, VA 22480
Owner Type: COMMERCIAL
Number of Active AST: 0
Number of Active UST: 0
Number of Inactive AST: 0
Number of Inactive UST: 6

Owner Id: 34157
Owner Name: PARVINS SUPER MARKET
Owner Address: GENERAL DELIVERY
Owner Address2: MIDDLESEX
Owner City, State, Zip: LOCUST HILL, VA 23092
Owner Type: COMMERCIAL
Number of Active AST: 0
Number of Active UST: 0
Number of Inactive AST: 0
Number of Inactive UST: 6

UST:
Facility ID: 4002797
Federally Regulated: Yes

Tank Number: 1
Tank Capacity: 10000
Tank Contents: GASOLINE

PARVINS SUPER MARKET (FORMER) (Continued) **U003683203**

Tank Status:	**REM FROM GRD**
Tank Type:	UST
Tank Material:	
Install Date:	4/16/1971
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported
Release Detection:	
Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported
Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

PARVINS SUPER MARKET (FORMER) (Continued) **U003683203**

Facility ID:	4002797
Federally Regulated:	Yes
Tank Number:	2
Tank Capacity:	10000
Tank Contents:	GASOLINE
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	4/16/1971
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported
Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No

PARVINS SUPER MARKET (FORMER) (Continued) **U003683203**

Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported
Facility ID:	4002797
Federally Regulated:	No
Tank Number:	3
Tank Capacity:	10000
Tank Contents:	KEROSENE
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	4/16/1971
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No

PARVINS SUPER MARKET (FORMER) (Continued) **U003683203**

Pipe Release Detection: Other Note	Not reported
Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported
Facility ID:	4002797
Federally Regulated:	Yes
Tank Number:	R4
Tank Capacity:	4000
Tank Contents:	GASOLINE
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	4/15/1983
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported

PARVINS SUPER MARKET (FORMER) (Continued) **U003683203**

Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported
Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported
Facility ID:	4002797
Federally Regulated:	Yes
Tank Number:	R5
Tank Capacity:	4000
Tank Contents:	DIESEL
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	4/15/1983
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No

PARVINS SUPER MARKET (FORMER) (Continued) **U003683203**

Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported

Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	Yes
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

Facility ID:	4002797
Federally Regulated:	No

Tank Number:	R6
Tank Capacity:	4000
Tank Contents:	DIESEL
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	Not reported
Tank Materials: Bare Steel	No
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

PARVINS SUPER MARKET (FORMER) (Continued) **U003683203**

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No
Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	Not reported
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported
Pipe Type:	Not reported
Pipe Materials: Bare Steel	No
Pipe Materials: Galvanized Steel	No
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

D17 **REVERE GAS, INC.** **TIER 2** **S118192981**
SSW **11128 GENERAL PULLER HIGHWAY** **N/A**
< 1/8 **HARTFIELD, VA 23071**
0.027 mi.
143 ft. **Site 1 of 2 in cluster D**

Actual:
78 ft.

Focus Map:
6

TIER 2:

Facility ID:	Not reported
CAS Number:	74986
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	Propane
Average Amt Code:	999999.0
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported
Facility ID:	5422183

REVERE GAS, INC. (Continued) **S118192981**

CAS Number:	74986
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	Propane
Average Amt Code:	9999
Owner Name:	Not reported
Owner Phone:	Not reported
Contact Type:	Not reported

D18
SSW
< 1/8
0.027 mi.
143 ft.

REVERE GAS & APPLIANCES, INC. **TIER 2** **S110069108**
11128 GENERAL PULLER HIGHWAY **N/A**
HARTFIELD, VA 23071

Site 2 of 2 in cluster D

Actual:
78 ft.

Focus Map:
6

TIER 2:

Facility ID:	Not reported
CAS Number:	74-98-6
SIC Code:	Not reported
NAICS:	Not reported
Entered Chemical Name:	PROPANE
Average Amt Code:	Not reported
Owner Name:	REVERE GAS & APPLIANCES, INC.
Owner Phone:	804-776-6834
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	74-98-6
SIC Code:	42271
NAICS:	Not reported
Entered Chemical Name:	PROPANE
Average Amt Code:	5
Owner Name:	REVERE GAS & APPLIANCES, INC.
Owner Phone:	804-776-6834
Contact Type:	Not reported

Facility ID:	Not reported
CAS Number:	74-98-6
SIC Code:	99999
NAICS:	Not reported
Entered Chemical Name:	PROPANE
Average Amt Code:	5
Owner Name:	REVERE GAS & APPLIANCES, INC.
Owner Phone:	804-776-6834
Contact Type:	Not reported

Count: 13 records

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
COUNTY	S118639938		REGENT ROAD AT DIRT BRIDGE ROAD	23169	SPILLS
COUNTY	S116162983		88 NO HEAD BOTTOM ROAD, LOCUST HILL	23092	SPILLS
HARTFIELD	S111331170		STAMPERS BAY ROAD		SPILLS
HARTFIELD	S118639981		GENERAL PULLER HIGHWAY	23071	SPILLS
HARTFIELD	S122855220	PULLER SOLAR FACILITY	INTERSECTION OF GENERAL PULLER HWY. & BOBS HOLE RD.		SPILLS
MIDDLESEX COUNTY	S109382912	HIGHWAY	5818 GENERAL PULLER HWY		SPILLS
MIDDLESEX COUNTY	S109381273	URBANNA HARBOUR CONDO. YACHT CLUB	URBANNA CREEK ACROSS FROM TOWN OF URBANNA		SPILLS
SALUDA	S109602572	EXXON	CORNER OF URBANNA ROAD		SPILLS
URBANNA	2009927365		URBANNA HARBOR MARINA		ERNS
URBANNA	2000530346		URBANNA CREEK		ERNS
URBANNA	S117368572	ROSEGILL FARM LLC PROPERTY	1824 URBANNA RD	23175	LUST, LTANKS
URBANNA	S122855215		PERKINS CREEK 922 LORD MOTT ROAD, URBANNA, VA 23175	23175	SPILLS
URBANNA	S113705242		WAVERLY ROAD / OLD VIRGINIA STREET		SPILLS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 9

Source: EPA
Telephone: N/A
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 9

Source: EPA
Telephone: N/A
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 9

Source: EPA
Telephone: N/A
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/03/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 9

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 07/27/2020
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 9

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 07/27/2020
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/16/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 4

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/16/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/16/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/16/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/16/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 11/04/2019
Date Data Arrived at EDR: 11/13/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 76

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/10/2020
Next Scheduled EDR Contact: 05/25/2020
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 11/22/2019
Date Data Arrived at EDR: 11/22/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 67

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/20/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 11/22/2019
Date Data Arrived at EDR: 11/22/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 67

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/20/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/19/2019
Date Made Active in Reports: 03/06/2020
Number of Days to Update: 78

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/24/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Department of Environmental Quality
Telephone: 804-698-4236
Last EDR Contact: 03/16/2020
Next Scheduled EDR Contact: 06/29/2020
Data Release Frequency: N/A

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Management Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 12/02/2019
Date Data Arrived at EDR: 12/03/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 69

Source: Department of Environmental Quality
Telephone: 804-698-4238
Last EDR Contact: 03/02/2020
Next Scheduled EDR Contact: 06/15/2020
Data Release Frequency: Semi-Annually

State and tribal leaking storage tank lists

LUST REG PD: Leaking Underground Storage Tank Sites

Leaking underground storage tank site locaitons. Includes: counties of Amelia, Brunswick, Charles City, Chesterfield, Dinwiddie, Essex, Gloucester, Goochland, Greensville, Hanover, Henrico, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Powhatan, Prince George, Richmond, Surry, Sussex, Westmoreland; cities of Colonial Heights, Emporia, Hopewell, Petersburg.

Date of Government Version: 12/02/2014
Date Data Arrived at EDR: 12/04/2014
Date Made Active in Reports: 01/16/2015
Number of Days to Update: 43

Source: Department of Environmental Quality Piedmont Regional Office
Telephone: 804-527-5020
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Quarterly

LUST REG VA: Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Albemarle, Augusta, Bath, Clarke, Fluvanna, Frederick, Greene, Highland, Nelson, Page, Rockbridge, Rockingham, Shenandoah, Warren; cities of Buena Vista, Charlottesville, Harrisonburg, Lexington, Staunton, Waynesboro, Winchester.

Date of Government Version: 12/06/2011
Date Data Arrived at EDR: 12/08/2011
Date Made Active in Reports: 01/16/2012
Number of Days to Update: 39

Source: Department of Environmental Quality Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: No Update Planned

LUST REG NO: Leaking Underground Storage Tank Tracking Database

Leaking underground storage tank site locations. Includes: counties of Arlington, Caroline, Culpeper, Fairfax, Fauquier, King George, Loudoun, Louisa, Madison, Orange, Prince William, Rappahannock, Spotsylvania, Stafford; cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas, Manassas Park.

Date of Government Version: 05/18/2004
Date Data Arrived at EDR: 05/22/2004
Date Made Active in Reports: 07/09/2004
Number of Days to Update: 48

Source: Department of Environmental Quality Northern Regional Office
Telephone: 703-583-3800
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG WC: Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Alleghany, Bedford, Botetourt, Craig, Floyd, Franklin, Giles, Henry, Montgomery, Patrick, Pulaski, Roanoke; cities of Bedford, Clifton Forge, Covington, Martinsville, Radford, Roanoke, Salem.

Date of Government Version: 06/04/2015
Date Data Arrived at EDR: 06/05/2015
Date Made Active in Reports: 07/07/2015
Number of Days to Update: 32

Source: Department of Environmental Quality West Central Regional Office
Telephone: 540-562-6700
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: No Update Planned

LUST REG TD: Leaking Underground Storage Tank Sites

Leaking underground storage tank site locations. Includes: counties of Accomack, Isle of Wight, James City, Northampton, Southampton, York; cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 07/05/2013
Date Made Active in Reports: 09/16/2013
Number of Days to Update: 73

Source: Department of Environmental Quality Tidewater Regional Office
Telephone: trofoia@deq.vir
Last EDR Contact: 09/26/2016
Next Scheduled EDR Contact: 01/09/2017
Data Release Frequency: Quarterly

LUST REG SW: Leaking Underground Storage Tank Database

Leaking underground storage tank site locations. Includes: counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, Wythe; cities of Bristol, Galax, Norton.

Date of Government Version: 07/15/2013
Date Data Arrived at EDR: 07/18/2013
Date Made Active in Reports: 09/16/2013
Number of Days to Update: 60

Source: Department of Environmental Quality Southwest Regional Office
Telephone: 276-676-4800
Last EDR Contact: 10/11/2016
Next Scheduled EDR Contact: 01/23/2017
Data Release Frequency: No Update Planned

LUST REG SC: Leaking Underground Storage Tanks

Leaking underground storage tank site locations. Includes: counties of Amherst, Appomattox, Buckingham, Campbell, Charlotte, Cumberland, Halifax, Lunenburg, Mecklenburg, Nottoway, Pittsylvania, Prince Deward; cities of Danville, Lynchburg.

Date of Government Version: 09/06/2013
Date Data Arrived at EDR: 09/06/2013
Date Made Active in Reports: 09/17/2013
Number of Days to Update: 11

Source: Department of Environmental Quality, South Central Region
Telephone: 434-582-5120
Last EDR Contact: 08/29/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Semi-Annually

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/10/2019
Date Data Arrived at EDR: 12/05/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 67

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/11/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/23/2020
Next Scheduled EDR Contact: 08/02/2020
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/03/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 72

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/15/2019
Date Data Arrived at EDR: 12/17/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/04/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/27/2020
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/01/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 10/02/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/01/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

LTANKS: Leaking Petroleum Storage Tanks
Includes releases of petroleum from underground storage tanks and aboveground storage tanks.

Date of Government Version: 11/04/2019
Date Data Arrived at EDR: 11/25/2019
Date Made Active in Reports: 02/03/2020
Number of Days to Update: 70
Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 02/26/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 08/27/2019
Date Data Arrived at EDR: 08/28/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 75
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 03/19/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Varies

UST: Registered Petroleum Storage Tanks
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/01/2019
Date Data Arrived at EDR: 11/25/2019
Date Made Active in Reports: 02/03/2020
Number of Days to Update: 70
Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 02/26/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Quarterly

AST: Registered Petroleum Storage Tanks
Registered Aboveground Storage Tanks.

Date of Government Version: 11/01/2019
Date Data Arrived at EDR: 11/25/2019
Date Made Active in Reports: 02/03/2020
Number of Days to Update: 70
Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 02/26/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Quarterly

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/01/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/03/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 72

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 10/02/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 10/11/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/11/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/01/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 68

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/04/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 02/27/2020
Number of Days to Update: 85

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/10/2019
Date Data Arrived at EDR: 12/05/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 67

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/24/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Engineering Controls Sites Listing

A listing of sites with Engineering Controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/07/2020
Date Data Arrived at EDR: 01/08/2020
Date Made Active in Reports: 03/13/2020
Number of Days to Update: 65

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Quarterly

INST CONTROL: Voluntary Remediation Program Database

Sites included in the Voluntary Remediation Program database that have deed restrictions.

Date of Government Version: 01/07/2020
Date Data Arrived at EDR: 01/08/2020
Date Made Active in Reports: 03/13/2020
Number of Days to Update: 65

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/18/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Varies

VRP: Voluntary Remediation Program

The Voluntary Cleanup Program encourages owners of elected contaminated sites to take the initiative and conduct voluntary cleanups that meet state environmental standards.

Date of Government Version: 01/07/2020
Date Data Arrived at EDR: 01/08/2020
Date Made Active in Reports: 03/13/2020
Number of Days to Update: 65

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Quarterly

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Site Specific Assessments

To qualify for Brownfields Assessment, the site must meet the Federal definition of a Brownfields and should have contaminant issues that need to be addressed and a redevelopment plan supported by the local government and community. Virginia's Department of Environmental Quality performs brownfields assessments under a cooperative agreement with the U.S. Environmental Protection Agency at no cost to communities, property owners or, prospective purchasers. The assessment is an evaluation of environmental impacts caused by previous site uses similar to a Phase II Environmental Assessment.

Date of Government Version: 01/20/2020
Date Data Arrived at EDR: 01/23/2020
Date Made Active in Reports: 03/31/2020
Number of Days to Update: 68

Source: Department of Environmental Quality
Telephone: 804-698-4207
Last EDR Contact: 04/22/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/02/2019
Date Data Arrived at EDR: 12/16/2019
Date Made Active in Reports: 03/06/2020
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/17/2020
Next Scheduled EDR Contact: 06/29/2020
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/16/2020
Next Scheduled EDR Contact: 08/10/2020
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/09/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 01/31/2020
Next Scheduled EDR Contact: 05/11/2020
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/21/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/21/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Quarterly

PFAS: Per- and Polyfluoroalkyl Substances

PFOS and PFOA stand for perfluorooctane sulfonate and perfluorooctanoic acid, respectively. Both are fluorinated organic chemicals, part of a larger family of compounds referred to as perfluoroalkyl substances (PFASs).

Date of Government Version: 01/21/2020
Date Data Arrived at EDR: 01/23/2020
Date Made Active in Reports: 03/31/2020
Number of Days to Update: 68

Source: Department of Environmental Quality
Telephone: 804-698-4336
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Varies

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/05/2019
Date Data Arrived at EDR: 12/06/2019
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 70

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/24/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

SPILLS WC: Prep Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/21/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, West Central Region
Telephone: 540-562-6700
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS SW: Reportable Spills

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 01/21/2010
Date Data Arrived at EDR: 01/22/2010
Date Made Active in Reports: 02/16/2010
Number of Days to Update: 25

Source: Department of Environmental Quality, Southwest Region
Telephone: 276-676-4839
Last EDR Contact: 07/13/2012
Next Scheduled EDR Contact: 10/29/2012
Data Release Frequency: No Update Planned

SPILLS NO: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, Northern Region
Telephone: 703-583-3864
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS TD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/17/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 13

Source: Department of Environmental Quality, Tidewater Region
Telephone: trofoia@deq.vir
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: Quarterly

SPILLS VA: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 08/08/2012
Date Data Arrived at EDR: 08/09/2012
Date Made Active in Reports: 10/05/2012
Number of Days to Update: 57

Source: Department of Environmental Quality, Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Quarterly

SPILLS: Prep/Spills Database Listing

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment. PREP staff often work to assist local emergency responders, other state agencies, federal agencies, and responsible parties, as may be needed, to manage pollution incidents. Oil spills, fish kills, and hazardous materials spills are examples of incidents that may involve the DEQ's PREP Program.

Date of Government Version: 11/04/2019
Date Data Arrived at EDR: 11/25/2019
Date Made Active in Reports: 02/04/2020
Number of Days to Update: 71

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 02/26/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Quarterly

SPILLS PD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 10/20/2009
Date Data Arrived at EDR: 10/29/2009
Date Made Active in Reports: 12/03/2009
Number of Days to Update: 35

Source: Department of Environmental Quality, Piedmont Region
Telephone: 804-527-5020
Last EDR Contact: 02/06/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Quarterly

SPILLS PC: Pollution Complaint Database

Pollution Complaints Database. The pollution reports contained in the PC database include the initial release reporting of Leaking Underground Storage Tanks and all other releases of petroleum to the environment as well as releases to state waters. The database is current through 12/1/93. Since that time, all spill and pollution reporting information has been collected and tracked through the DEQ regional offices.

Date of Government Version: 06/01/1996
Date Data Arrived at EDR: 10/22/1996
Date Made Active in Reports: 11/21/1996
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 03/08/2010
Next Scheduled EDR Contact: 06/21/2010
Data Release Frequency: No Update Planned

SPILLS BRL: Prep/Spills Database Listing

A listing of spills locations located in the Blue Ridge Regional area, Lynchburg.

Date of Government Version: 09/18/2009
Date Data Arrived at EDR: 09/18/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 18

Source: DEQ, Blue Ridge Regional Office
Telephone: 434-582-6218
Last EDR Contact: 11/28/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Varies

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 09/01/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 43

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/16/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 11/12/2019
Date Data Arrived at EDR: 11/19/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 70

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/19/2020
Next Scheduled EDR Contact: 06/01/2020
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/06/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/13/2020
Next Scheduled EDR Contact: 05/25/2020
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/16/2019
Date Data Arrived at EDR: 12/19/2019
Date Made Active in Reports: 02/27/2020
Number of Days to Update: 70

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/24/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/03/2020
Next Scheduled EDR Contact: 05/18/2020
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/07/2020
Next Scheduled EDR Contact: 05/18/2020
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/20/2020
Next Scheduled EDR Contact: 06/29/2020
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 79

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/05/2020
Next Scheduled EDR Contact: 06/01/2020
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 10/23/2019
Date Made Active in Reports: 01/15/2020
Number of Days to Update: 84

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/21/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 9

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 06/15/2020
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/05/2019
Date Data Arrived at EDR: 11/20/2019
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 149

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/15/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/06/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 8

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 05/18/2020
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 10/09/2019
Date Data Arrived at EDR: 10/11/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 70

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 10/25/2019
Date Data Arrived at EDR: 10/25/2019
Date Made Active in Reports: 01/15/2020
Number of Days to Update: 82

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 08/03/2020
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 01/15/2020
Number of Days to Update: 42

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/06/2020
Next Scheduled EDR Contact: 06/15/2020
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 02/27/2020
Next Scheduled EDR Contact: 06/15/2020
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 02/07/2020
Next Scheduled EDR Contact: 05/18/2020
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 07/01/2019
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80
Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/28/2020
Next Scheduled EDR Contact: 05/11/2020
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 01/17/2020
Date Made Active in Reports: 03/06/2020
Number of Days to Update: 49

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/25/2020
Next Scheduled EDR Contact: 07/06/2020
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 01/31/2020
Next Scheduled EDR Contact: 05/18/2020
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/21/2020
Next Scheduled EDR Contact: 06/01/2020
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 02/05/2020
Date Made Active in Reports: 02/14/2020
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 12/03/2019
Date Data Arrived at EDR: 12/03/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 56

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 03/02/2020
Next Scheduled EDR Contact: 06/15/2020
Data Release Frequency: Quarterly

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/06/2019
Date Data Arrived at EDR: 11/25/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 64

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/25/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/28/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/28/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/09/2019
Date Data Arrived at EDR: 12/11/2019
Date Made Active in Reports: 02/27/2020
Number of Days to Update: 78

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/05/2020
Next Scheduled EDR Contact: 06/22/2020
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/22/2019
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 03/02/2020
Number of Days to Update: 89

Source: EPA
Telephone: (215) 814-5000
Last EDR Contact: 03/03/2020
Next Scheduled EDR Contact: 06/15/2020
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/03/2020
Next Scheduled EDR Contact: 07/27/2020
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/05/2020
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/06/2020
Number of Days to Update: 59

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 04/07/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 02/21/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 11/18/2019
Date Data Arrived at EDR: 11/19/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 70

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/19/2020
Next Scheduled EDR Contact: 06/01/2020
Data Release Frequency: Quarterly

AIRS: Permitted Airs Facility List

A listing of permitted Airs facilities.

Date of Government Version: 12/23/2019
Date Data Arrived at EDR: 01/02/2020
Date Made Active in Reports: 03/03/2020
Number of Days to Update: 61

Source: Department of Environmental Quality
Telephone: 804-698-4000
Last EDR Contact: 03/16/2020
Next Scheduled EDR Contact: 06/29/2020
Data Release Frequency: Annually

CEDS: Comprehensive Environmental Data System

Virginia Water Protection Permits, Virginia Pollution Discharge System (point discharge) permits and Virginia Pollution Abatement (no point discharge) permits.

Date of Government Version: 12/11/2019
Date Data Arrived at EDR: 12/20/2019
Date Made Active in Reports: 03/03/2020
Number of Days to Update: 74

Source: Department of Environmental Quality
Telephone: 804-698-4077
Last EDR Contact: 03/02/2020
Next Scheduled EDR Contact: 06/15/2020
Data Release Frequency: Quarterly

COAL ASH: Coal Ash Disposal Sites

A listing of facilities with coal ash impoundments.

Date of Government Version: 12/19/2019
Date Data Arrived at EDR: 12/23/2019
Date Made Active in Reports: 03/03/2020
Number of Days to Update: 71

Source: Department of Environmental Protection
Telephone: 804-698-4285
Last EDR Contact: 03/02/2020
Next Scheduled EDR Contact: 06/15/2020
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner List

A listing of registered drycleaners.

Date of Government Version: 10/21/2019
Date Data Arrived at EDR: 10/23/2019
Date Made Active in Reports: 01/03/2020
Number of Days to Update: 72

Source: Department of Environmental Quality
Telephone: 804-698-4407
Last EDR Contact: 03/26/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Varies

ENFORCEMENT: Enforcement Actions Data

A listing of enforcement actions.

Date of Government Version: 11/21/2019
Date Data Arrived at EDR: 11/21/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 68

Source: Department of Environmental Quality
Telephone: 804-698-4031
Last EDR Contact: 03/23/2020
Next Scheduled EDR Contact: 07/13/2020
Data Release Frequency: Quarterly

Financial Assurance 1: Financial Assurance Information Listing

A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 01/27/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 03/31/2020
Number of Days to Update: 63

Source: Department of Environmental Quality
Telephone: 804-698-4205
Last EDR Contact: 04/17/2020
Next Scheduled EDR Contact: 08/10/2020
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information listing

Solid waste financial assurance information.

Date of Government Version: 01/28/2020
Date Data Arrived at EDR: 01/30/2020
Date Made Active in Reports: 03/31/2020
Number of Days to Update: 61

Source: Department of Environmental Quality
Telephone: 804-698-4123
Last EDR Contact: 04/17/2020
Next Scheduled EDR Contact: 08/10/2020
Data Release Frequency: Varies

TIER 2: Tier 2 Information Listing

A listing of facilities which store or manufacture hazardous materials and submit a chemical inventory report.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 01/20/2017
Date Made Active in Reports: 02/14/2017
Number of Days to Update: 25

Source: Department of Environmental Quality
Telephone: 804-698-4159
Last EDR Contact: 03/16/2020
Next Scheduled EDR Contact: 06/29/2020
Data Release Frequency: Annually

UIC: Underground Injection Control Wells

A listing of underground injection controls wells.

Date of Government Version: 10/29/2019
Date Data Arrived at EDR: 10/30/2019
Date Made Active in Reports: 01/10/2020
Number of Days to Update: 72

Source: Department of Mines, Minerals and Energy
Telephone: 276-415-9700
Last EDR Contact: 03/31/2020
Next Scheduled EDR Contact: 05/11/2020
Data Release Frequency: Quarterly

MINES MRDS: Mineral Resources Data System

Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 02/28/2020
Next Scheduled EDR Contact: 06/08/2020
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Virgina.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 203

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Virgina and at the Regional VA Levels.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/15/2014
Number of Days to Update: 198

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 01/30/2020
Date Data Arrived at EDR: 01/30/2020
Date Made Active in Reports: 03/09/2020
Number of Days to Update: 39

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 01/30/2020
Next Scheduled EDR Contact: 05/25/2020
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/10/2020
Next Scheduled EDR Contact: 07/20/2020
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 06/21/2019
Number of Days to Update: 51

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 01/31/2020
Next Scheduled EDR Contact: 05/11/2020
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/02/2020
Next Scheduled EDR Contact: 07/27/2020
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 10/02/2019
Date Made Active in Reports: 12/10/2019
Number of Days to Update: 69

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/18/2020
Next Scheduled EDR Contact: 06/01/2020
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/09/2020
Next Scheduled EDR Contact: 06/22/2020
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

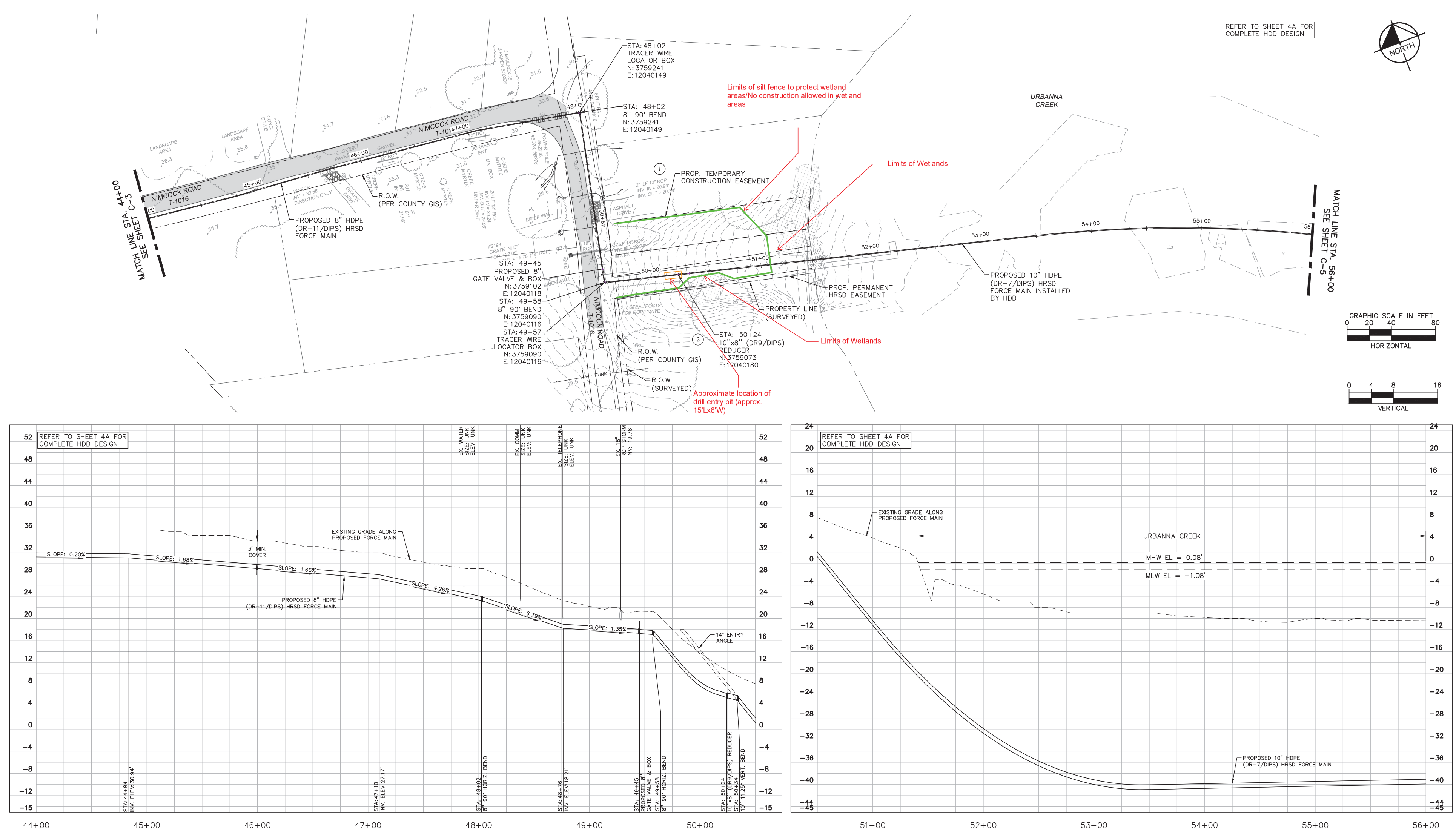
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 804-692-1900

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION



90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

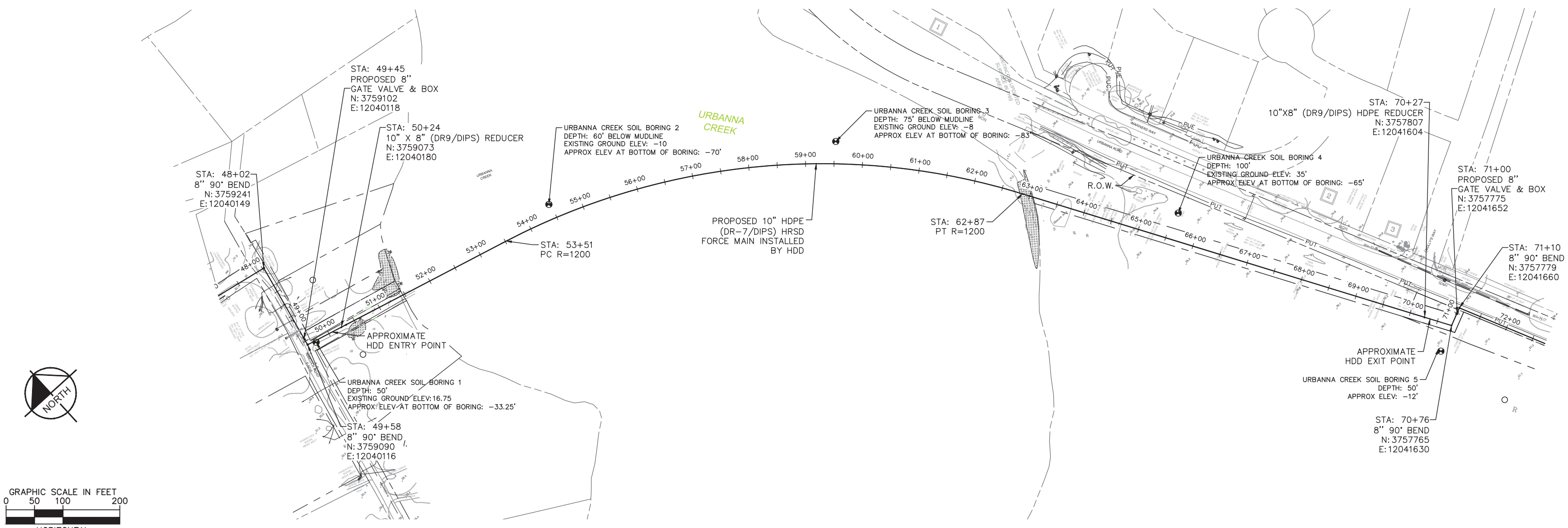
FORCE MAIN PLAN & PROFILE STA. 44+00 - 56+00

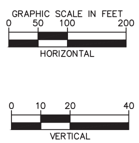
HAMPTON ROADS SANITATION DISTRICT

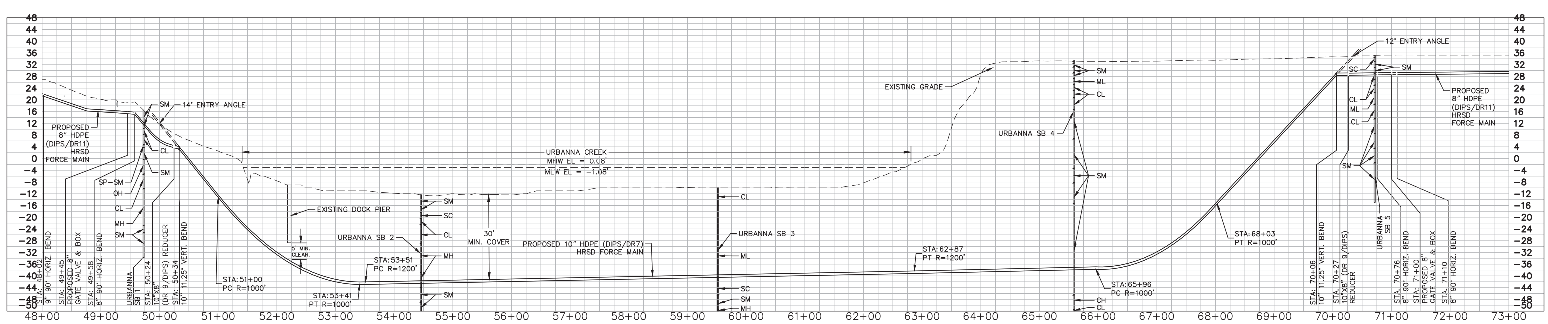
Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-4
SCALE:		SHEET NO.:	8 of 93

URBANNA CREEK HDD PLAN & PROFILE







90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

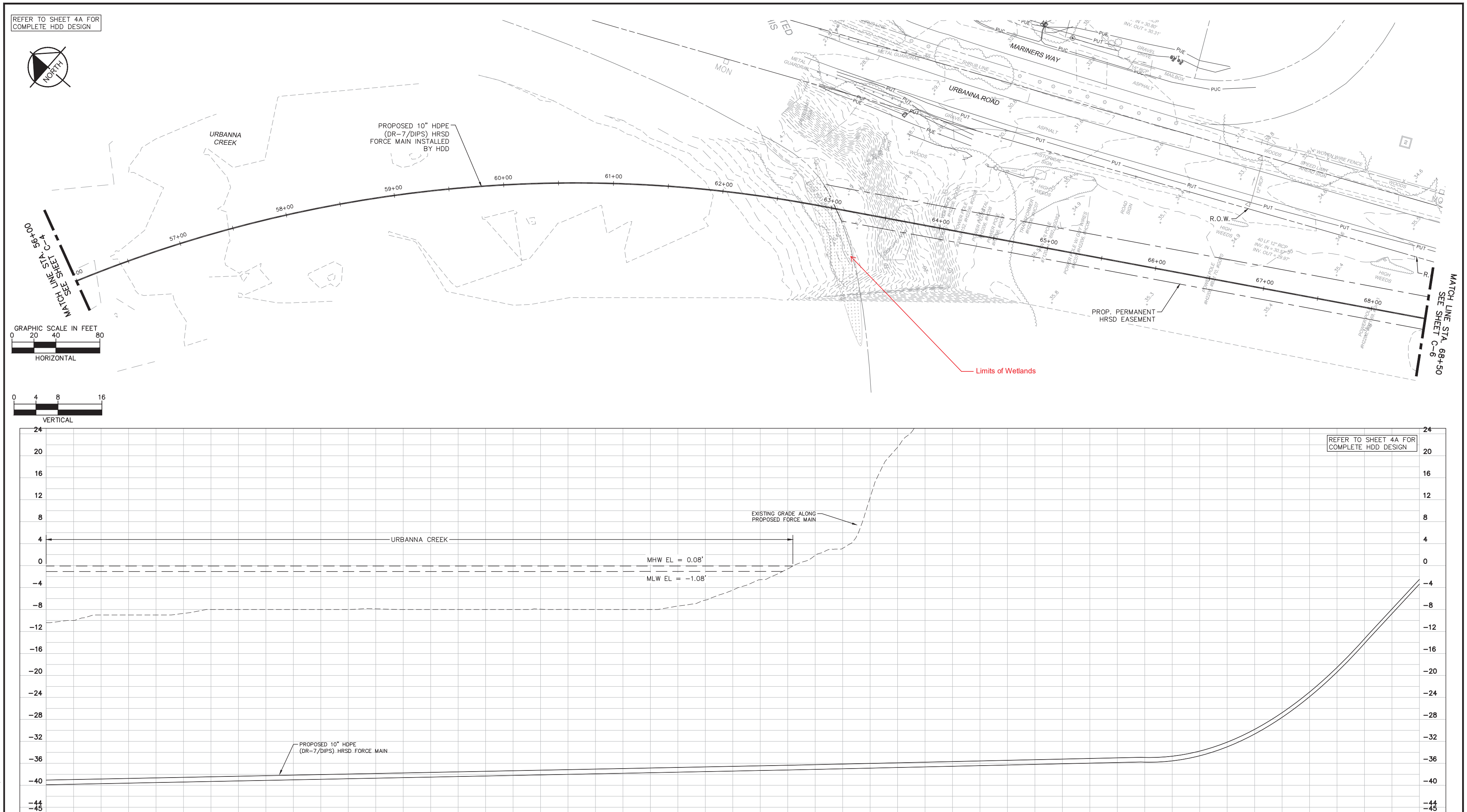
NO.	DATE	BY	REVISION

URBANNA CREEK HDD PLAN & PROFILE

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-4A
SCALE:		SHEET NO.:	9 of 93



90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

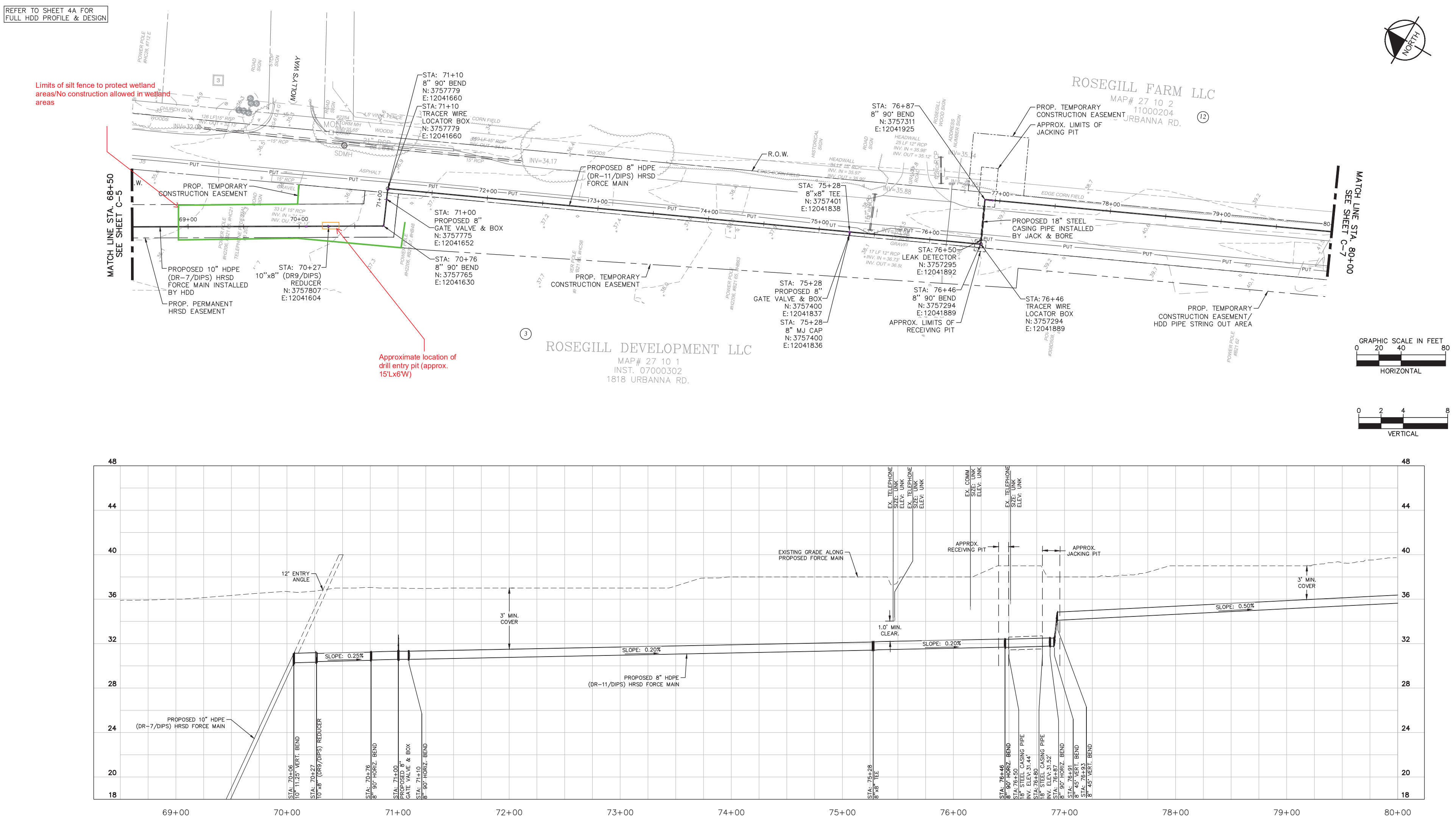
NO.	DATE	BY	REVISION

FORCE MAIN PLAN & PROFILE STA. 56+00 - 68+50

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-5
SCALE:		SHEET NO.:	10 of 93



90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FORCE MAIN PLAN & PROFILE STA. 68+50 - 80+00

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-6
SCALE:		SHEET NO.:	11 of 93

Appendix B: Final Preliminary Engineering Report

This page intentionally left blank

Preliminary Engineering Report

Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main

MP013700 • DECEMBER 2020

PREPARED FOR:

HRSD

PREPARED BY:

Kimley»Horn
4525 Main Street, Suite 1000
Virginia Beach, VA 23462

TETRA TECH
5700 Lake Wright Drive, Suite 102
Norfolk, VA 23502

COMMONWEALTH OF VIRGINIA
G. SCOTT FUNK
Lic. No. 038714
12/18/20
PROFESSIONAL ENGINEER

Table of Contents

Tables

Figures

Appendices

Abbreviations

AACE: Association for the Advancement of Cost Engineering

ACHP: Advisory Council on Historic Preservation

ADF: Average Daily Flow

BMP: Best Management Practice

CBPA: Chesapeake Bay Preservation Area

CIP: Capital Improvement Program

CCB: Center for Conservation Biology

C-factor: Hazen Williams Roughness Coefficient

CHMRS: Corridor Hazardous Materials Reconnaissance Survey

CTC: Certificate to Construct

CTO: Certificate to Operate

CWA: Clean Water Act

CWRLF: Clean Water Revolving Loan Fund

CWFAP: Clean Water Financing and Assistance Program

CY: Cubic Yard

DIP: Ductile Iron Pipe

DIPS: Ductile Iron Pipe Size

DR: Dimension Ratio

DNH: Division of Natural Heritage

EA: Environmental Assessment

EDR: Environmental Database Resource

EPS: Extended Period Simulation

ESA: Endangered Species Act

ESC: Erosion and Sediment Control

FEMA: Federal Emergency Management Agency

FMA: Force Main Alignment

FPS: Feet per Second

FPVC: Flexible Polyvinyl Chloride

FT: Feet

Gal: Gallons

GIS: Geographic Information System

GPD: Gallons per day

GPM: Gallons per minute

HDD: Horizontal Directional Drill

HDPE: High-Density Polyethylene

HP: Horsepower

HRLY: Hourly

HRSD: Hampton Roads Sanitation District

HZ: Hertz

IFM: Interceptor Force Main

ID: Inside Diameter

IPaC: Information Planning and Consultation System

JPA: Joint Permit Application

KW: Kilo-watt

LDP: Land Disturbing Permit

LEED: Leadership in Energy and Environmental Design

LWBs: Local Wetlands Boards

MISPPI: Middlesex Interceptor System Program Phase I

MISPPII: Middlesex Interceptor System Program Phase II

MM: Millimeter

MOT: Maintenance of Traffic

MTFM: Middlesex Transmission Force Main

NEPA: National Environmental Policy Act

NHD: National Hydrography Dataset

NHPA: National Historic Preservation Act

NLEB: Northern Long-Eared Bat

NRCS: National Resources Conservation Service

NRHP: National Register of Historic Places

NWI: National Wetland Inventory

NWP-12: Nationwide Permit 12

PEM: Palustrine Emergent

PER: Preliminary Engineering Report

PSI: Pounds per Square Inch

PRS: Pressure Reducing Station

PS: Pump Station

RECs: Recognized Environmental Conditions

RMAs: Resource Management Areas

ROW: Right-of-Way

RPA: Resource Protection Area

RTE: Route

SA: Service Area

SCAT: Sewage Collection and Treatment

SHPO: State Historic Preservation Officer

SER: State Environmental Review

SPGP: State Programmatic General Permit

TDH: Total Dynamic Head

TFM: Transmission Force Main

T & E: Threatened and Endangered

TP: Treatment Plant

USACD: Unites States Army Corps of Engineers

USACE: U.S. Army Corps of Engineers

USFWS: U.S. Fish and Wildlife Services

USGS: U.S. Geological Survey

V: Volts

V-CRIS: Virginia Cultural Resource Information System

VaFWIS: Virginia Fish and Wildlife Information Service

VCWRLF: Virginia Clean Water Revolving Loan Fund

VDACS: Virginia Department of Agriculture and Consumer Services

VDCR-DNH: Virginia Department of Conservation and Recreation Division of Natural Heritage

VDEQ: Virginia Department of Environmental Quality

VDCR: Virginia Department of Conservation and Recreation

VDHR: Virginia Department of Historic Resources

VDOT: Virginia Department of Transportation

VDWR: Virginia Department of Wildlife Resources

VFDs: Variable Frequency Drives

VMRC: Virginia Marine Resources Commission

VPDES: Virginia Pollutant Discharge Elimination System

VSMP: Virginia Stormwater Management Program

WERMS: Wildlife Environmental Review Map Service

WRDA: Water Resources Development Act

WWTP: Wastewater Treatment Plant

YRTP: York River Treatment Plant

YR: Year

Executive Summary

Introduction

Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design and construction of a sewage conveyance system to serve Middlesex County. A small diameter transmission force main will serve as the system backbone and extend 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and equalization tanks. The project will also provide for future connections to the Topping Service Area near the Route 3/Route 33 intersection, Christchurch Service Area, and the Deltaville Service Area near Hartfield along General Puller Highway. HRSD engaged the Kimley-Horn/Tetra Tech team to provide preliminary engineering services for this program.

Hydraulic Analysis

A hydraulic analysis was performed as part of this study to identify the proposed infrastructure required as part of MISPPII to accommodate projected sanitary sewer flows from Middlesex County and to identify impacts of conveying additional sanitary sewer flows into the existing downstream Mathews transmission force main system.

Anticipated flows in 2025, 2030 and 2040 (full build-out condition) were developed based on information available at the time of this report regarding the likelihood and timing of future flows within contributing service areas being conveyed into the MISPPII force main. Due to the level of uncertainty of the quantity and timing of future flows, the projected flows anticipated in 2030 were utilized for the preliminary design of the MISPPII system with consideration for future improvements to the system to convey 2040 flows (full build-out condition). Flows used for the preliminary design of the MISPPII system (2030 flows) and build-out conditions (2040) are summarized in Table I.

Table I: Summary of Future Flow Projections

Contributing Sewer Shed	**2030**		**2040**	
	Average (gpd/gpm)	Peak (gpd/gpm)	Average (gpd/gpm)	Peak (gpd/gpm)
Middlesex	336,000 / 233	838,000/ 582	528,000/ 367	1,300,000/ 902
Mathews	100,000 / 69	250,000 / 174	100,000 / 69	250,000 / 174
Total	425,000 / 302	1,038,000/ 721	628,000/ 436	1,550,000/ 1076

Because of the long distances required to convey wastewater, the MISPPII system requires a combination of pumping stations and equalization along the force main to control peak flow rates, provide optimum force main and pump sizing, and provide system reliability.

The existing Mathews system does not have the capacity to accommodate anticipated 2030 flows from the proposed Middlesex system. Pump upgrades are necessary at both the Mathews County Line and the Beaver Dam pump stations to convey projected flows from Mathews and Middlesex Counties and convey excess flow during wet weather. Discussion of the necessary improvements in the Mathews system is included in the following section.

Recommendations

Force Main Piping and Alignment

The hydraulic model was utilized to identify the size of the proposed MISPPII force main. Force main capacity was analyzed to ensure projected average day full buildout flow rates from Middlesex County could be conveyed through the MISPPII force main without exceeding the pressure limitations of the pipeline material. Based on the model, 8-inch HDPE (DIPS/DR 11) is recommended for the force main throughout the majority of the corridor. The diameter and DR rating of the force main between the Hartfield pump station and the interconnection of the MISPPII force main and the Mathews force main will be finalized during the design phase. The recommended force main alignment is shown on the preliminary plans included in Appendix C with an overview provided in Figure I and includes approximately 86,000 linear feet 8-inch HDPE (DIPS/DR11). The alignment was selected to account for future Middlesex County water and sewer system improvements, minimize impacts to traffic and the environment, and locate the pipeline in areas that can be easily accessed and maintained in the future. The alignment is located within Virginia Department of Transportation (VDOT) right-of-way, except at key locations including at waterway crossings. It should be noted that there is little flexibility for the alignments for the two waterway crossings/horizontal directional drills; therefore, HRSD should initiate negotiations with the property owners as soon as possible.

Middlesex System Pump Stations and Equalization Storage Facilities

Alternative sites for the Central Middlesex and Urbanna pump stations as well as pumping facilities along the Middlesex force main were evaluated as part of this study. The locations of the pump stations were selected based on the results of the hydraulic model and proximity to planned County sewer service areas.

System optimization and capacity limitations in the downstream Mathews system require the use of system equalization basins. Equalization basins were considered at proposed pump station locations. Equalization basin sizing was evaluated with HRSD to provide system reliability and potential for future upgrades. The need for equalization was evaluated for both dry weather and wet weather conditions. Equalization facilities are proposed to store peak flows until they can be later released into the system during low flow conditions.

Recommendations for pump stations and equalization storage for this project include implementing the following:

- Central Middlesex Treatment Plant Pump Station – Alternative 1 (existing parking lot adjacent to treatment plant), a duplex submersible pump station with pumps discharging 50 gpm at up to 203 feet TDH to a3-inch force main (3-inch force main being constructed as part of HRSD's Middlesex Interceptor Force Main Phase I – Cook's Corner (MP013600) project). This alternative was selected as it can be constructed without impacting the existing treatment plant operations and

places the pump station in a more accessible location for vehicular access compared to where it would be if located at the existing treatment plant site.

- Urbanna Treatment Plant Pump Station – Alternative 4 (southwest corner of parcel adjacent to Tabor Park), a duplex submersible pump station with discharging 300 gpm at up to 216 feet TDH with no equalization storage facility. This alternative was selected because it will allow HRSD to eliminate the existing Bonner Street pump station and minimizes impacts to the Town of Urbanna Tabor Park.
- Construct new Locust Hill and Hartfield pump stations along MISPPII force main with equalization storage facilities at the locations shown on the preliminary plans included in Appendix C. Preliminary pump station plan views are included in Appendix H.
    - Locust Hill duplex submersible pump station with pumps discharging 300 gpm at 96 feet TDH. A total of 100,000 gallons of equalization storage at the site.
    - Hartfield dry pit submersible pump station with pumps in series discharging 300 gpm at 340 feet TDH. A total of 275,000 gallons of equalization storage at the site.
- Install new pumps and controls at Cook's Corner pump station to meet the new operating conditions (90 gpm at 138 feet TDH) once the new force main is placed into service.

An overview of the recommended Middlesex system is provided in Figure I.

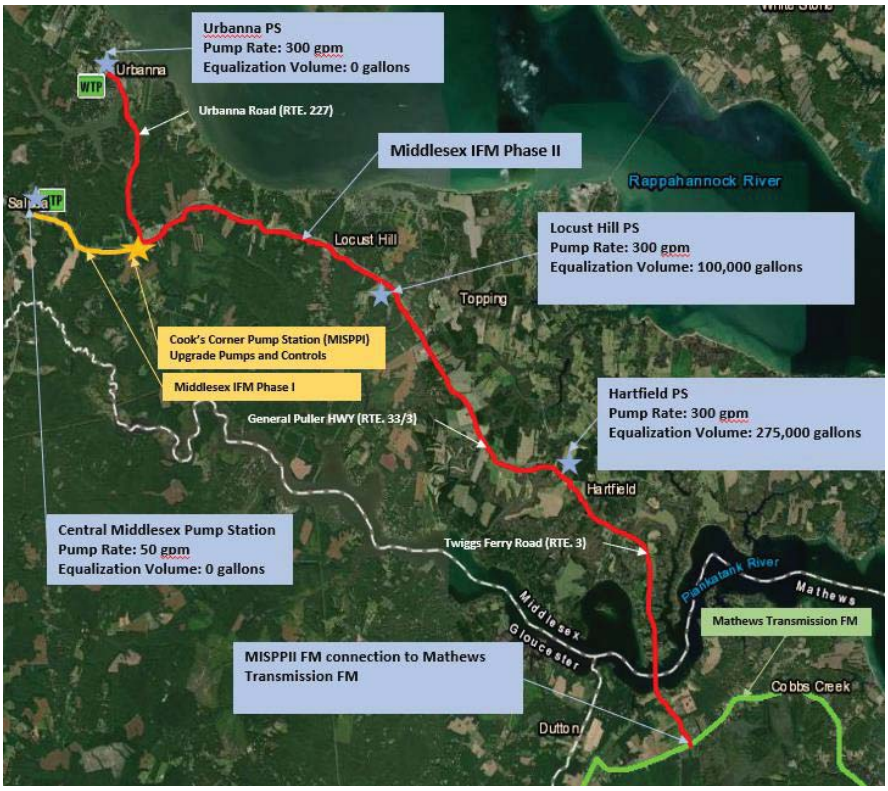


Figure I: Middlesex Interceptor Sewer Program Phase II Improvements

Mathews System Improvements

Due to the limited existing capacity in the Mathew system, improvements will be required to convey flows from Middlesex County service areas. Capacity in the Mathews system should be increased to convey average daily flows from both Middlesex and Mathews County service area. In order to reduce equalization requirements to accommodate wet weather events, capacity in the Mathews system downstream of the County Line pump station should be increased to 431 gpm. Increasing the capacity of the system to 431 gpm will accommodate the maximum anticipated flow rate being discharged into the County Line pump station when the Hartfield pump station is operating and the Buckley Hall pump station is operating. The following improvements are anticipated to be required to accommodate increased capacity in the Mathews system downstream of the connection of the MISPPII force main:

- Installation of new pumps and controls at County Line pump station and Beaver Dam pump station to meet new operating conditions required to increase Mathews system capacity.
- Construct new pump station in Gloucester County half-way between County Line pump station and Beaver Dam pump station.

An overview of the recommended improvements in the Mathews system is provided in Figure II.

Figure II: Mathews System Improvements

MISPPII CIP Projects

The proposed MISPPII improvements will be broken into three separate CIP projects. The three CIP projects are listed in Table II with the descriptions of work anticipated to be included in each.

Table II: Summary of Estimated Easement Acquisition Costs

CIP Project	Description of Work
MP013710 Middlesex Saluda Pump Station	• Central Middlesex Pump Station • Central Middlesex Treatment Plant decommissioning • Middlesex Interceptor Sewer Program Phase I force main extension to Central Middlesex PS
MP013720 Hartfield Pump Station	• Hartfield pump station • Branch force main connections from Middlesex transmission force main to Hartfield pump station
MP013730 Middlesex Transmission Force Main	• Middlesex transmission force main from Urbanna pump station to connection to Mathews transmission force main • Urbanna Pump Station • Urbanna Treatment Plant decommissioning • Locust Hill pump station • Cook's Corner pump station upgrades • County Line pump station upgrades • Beaver Dam pump station upgrades • New pump station in Mathews system between County Line pump station and Beaver dam pump station

Property/Acquisition Requirements

A total of 92 parcels are anticipated to be impacted based on the recommended alternatives. This total is based on assumption that easements will be needed along Twiggs Ferry Road between General Puller Highway and the Piankatank River bridge where there is uncertainty as to whether the existing road is within a prescriptive right of way. Easements in this area may not be needed; however, this can't be determined until the design phase when property research is conduct with the survey effort. Easement needs are shown on the preliminary force main plans included in Appendix C and a summary of estimated acquisition costs associated with each CIP project is presented in Table III.

Table III: Summary of Estimated Easement Acquisition Costs

CIP Project	Temporary Easement Cost	Permanent Easement Cost	Parcel Acquisition Cost	Total
MP013710 Middlesex Saluda Pump Station	-	-	$2,074	$2,074
MP013720 Hartfield Pump Station	$142	$7584	$11,387	$19,113
MP013730 Middlesex Transmission Force Main	$43,947	$184,399	$60,295	$288,582
Total Estimated Easement/Property Acquisition Cost				**$309,769**

Project Schedule

A summary of milestones for the project is presented in Table IV.

Table IV: Summary of Project Milestones

Project Milestone	Anticipated Date
Notice to Proceed (Design)	February 2021
50% Progress Submittal	June 2021
Easement Plats to HRSD	September 2021
90% Progress Submittal	October 2021
Bid Ready Documents	January 2022
Bid/Award Phase- MP013720 & MP013730	January 2022 – February 2022
Construction Phase - MP013720 & MP013730	April 2022 – June 2024
Bid/Award Phase- MP013710	May 2022 – July 2022
Construction Phase - MP013710	August 2022 – October 2024

Program Costs

A Class 3 Estimate was generated following the intent of the AACE International Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries. The accuracy of this type of estimate can range from -10% to -20% on the low side, and +10% to +30% on the high side. During this phase in design the latest published 20-city average ENR construction cost index was $11,455 which is an average index for August 2020. A summary of program costs is included in Table V, Table VI and Table VII for each of the three CIP projects. A summary of total costs associated with the three CIP projects anticipated as part of the MISPPII improvements is provided in Table VIII. The CIP project estimate from HRSD's Middle Peninsula Treatment Plant Service Area CIP is included in Table VIII.

Table V: MP013710 Middlesex Saluda Pump Station Capital Budget Summary

Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Project Construction	-	$1,229,000	$1,536,000	$1,997,000
Construction Contingency	20%	$246,000	$307,000	$399,000
Project Construction		**$1,475,000**	**$1,843,000**	**$2,396,000**
Easement Acquisition**	Estimate	$2,000	$2,000	$2,000
Preliminary Engineering	-	-	-	-
Engineering Design	10%	$148,000	$184,000	$240,000
Pre-Construction/Bid Phase Services	0.15%	$2,000	$3,000	$4,000
Construction Administration	1.5%	$22,000	$28,000	$36,000
Construction Inspection	10%	$148,000	$184,000	$240,000
Estimated Program Cost		**$1,797,000**	**$2,244,000**	**$2,918,000**

*All values rounded to nearest $1,000
**Easement acquisition cost estimates only include land value and do not include costs associated with negotiating and acquiring easements/property

Table VI: MP013720 Hartfield Pump Station Capital Budget Summary

Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Project Construction	-	$2,846,000	$3,557,000	$4,624,000
Construction Contingency	20%	$569,000	$711,000	$925,000
Project Construction		**$3,415,000**	**$4,268,000**	**$5,549,000**
Easement Acquisition**	Estimate	$19,000	$19,000	$19,000
Preliminary Engineering	-	-	-	-
Engineering Design	10%	$342,000	$427,000	$555,000
Pre-Construction/Bid Phase Services	0.15%	$5,000	$6,000	$8,000
Construction Administration	1.5%	$51,000	$64,000	$83,000
Construction Inspection	10%	$342,000	$427,000	$555,000
Estimated Program Cost		**$4,174,000**	**$5,211,000**	**$6,769,000**

*All values rounded to nearest $1,000
**Easement acquisition cost estimates only include land value and do not include costs associated with negotiating and acquiring easements/property

Table VII: MP013730 Middlesex Transmission Force Main Capital Budget Summary

Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Project Construction	-	$17,942,000	$22,427,000	$29,155,000
Construction Contingency	20%	$3,588,000	$4,485,000	$5,831,000
Project Construction		**$21,530,000**	**$26,912,000**	**$34,986,000**
Easement Acquisition**	Estimate	$289,000	$289,000	$289,000
Preliminary Engineering	Actual Cost	$448,000	$448,000	$448,000
Engineering Design	10%	$2,153,000	$2,691,000	$3,499,000
Pre-Construction/Bid Phase Services	0.15%	$32,000	$40,000	$52,000
Construction Administration	1.5%	$323,000	$404,000	$525,000
Construction Inspection	10%	$2,153,000	$2,691,000	$3,499,000
Estimated Program Cost		**$26,928,000**	**$33,475,000**	**$43,298,000**

*All values rounded to nearest $1,000
**Easement acquisition cost estimates only include land value and do not include costs associated with negotiating and acquiring easements/property

Table VII: Middlesex Interceptor Program Phase II Capital Budget Summary

Description	CIP Estimate	% of Construction	AACE Class 3 Estimate Range		
			Low (-20%)	Base Estimate	High (+30%)
Project Construction	$24,041,000	-	$22,017,000	$27,520,000	$35,776,000
Construction Contingency	$4,452,000	20%	$4,403,000	$5,503,000	$7,155,000
Project Construction	**$28,493,000**		$26,420,000	$33,023,000	$42,931,000
Easement Acquisition	-	Estimate	$310,000	$310,000	$310,000
Preliminary Engineering	$688,000	Actual Cost	$448,000	$448,000	$448,000
Engineering Design	$1,781,000	10%	$2,643,000	$3,302,000	$4,294,000
Pre-Construction/Bid Phase Services	$25,000	0.15%	$39,000	$49,000	$64,000
Construction Administration	-	1.5%	$396,000	$496,000	$644,000
Construction Inspection	-	10%	$2,643,000	$3,302,000	$4,294,000
Estimated Program Cost	**$30,992,000****		$32,899,000	$40,930,000	$52,985,000

*All values rounded to nearest $1,000
**CIP Project Cost includes additional $25,000 close out cost not shown in table
***Easement acquisition cost estimates only include land value and do not include costs associated with negotiating and acquiring easements/property

1 Introduction

Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design of approximately 3.2 miles of sewer force main from Urbanna to Cook's Corner in addition to approximately 13 miles of sewer force main along Route 33 between Cook's Corner and the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and equalization tanks. The project will also provide for future connections to the Kilmer Lane Service Area near Urbanna, the Topping Service Area near the Route 3/Route 33 intersection, Christchurch Service Area, and the Deltaville Service Area near Hartfield along General Puller Highway. New pump stations are proposed at the two existing treatment plants that will be decommissioned in addition to three new "booster" pump stations along the proposed force main alignment and installation of a new "booster" pump station along HRSD's existing Mathews interceptor force main. HRSD engaged the Kimley-Horn/Tetra Tech team to provide preliminary engineering services for this program.

1.1 Background

HRSD determined it was more cost effective to install a new force main and pumping system to convey wastewater generated from the Urbanna/Central Middlesex service areas to their existing York River Treatment Plant (YRTP) rather than continue to operate their existing Central Middlesex and Urbanna Treatment Plants. The transmission force main and associated pump stations will serve as the backbone to centralized sanitary sewer service within Middlesex County. Funding for the MISPPII will be through the Virginia Clean Water Revolving Loan Fund (VCWRLF).

Alternatives corridors for the MISPPII were identified, evaluated and ultimately the preferred corridor for the MISPPII was selected in the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main (CIP MP013700): Design Criteria Development and Corridor Evaluation prepared by Jacobs for HRSD in November 2019.

1.2 Goals and Objectives

The objective of this project is to provide reliable sanitary sewer service to Middlesex County accomodating both current and future sanitary sewer flows and to allow two existing HRSD wastewater treatment plants in Middlesex County to be decommissioned, which will enhance water quality in the region.

The following scope of services were established as part of this Preliminary Engineering Report (PER):

- Perform research of available projects and other related data applicable to project.
- Complete a corridor analysis to identify the preferred pipeline location in the project corridor.
- Identify potential enhancements to the constructability by evaluating alternative construction methods for force main installation.
- Incorporate future maintenance considerations into the design.
- Assess impacts to existing utilities.

- Identify impacts on the public including traffic, neighborhoods, and any proposed development and transportation plans.
- Identify impacts to public and private properties.
- Identify potential permanent and temporary construction easements.
- Identify permitting requirements.
- Perform research of available projects and other related data applicable to the project.
- Prepare a preliminary Level 1 Corridor HAZMAT Reconnaissance Survey to identify known or suspected areas of subsurface contamination in or immediately adjacent to both corridors.
- Obtain and review an Environmental Database Resource (EDR) report encompassing both corridors for the potential to encounter wetlands, protected species, cultural resources, and the potential to impact floodplains and Chesapeake Bay Preservation Area (CBPA) buffers.
- Identify impacts to public and private properties.
- Prepare a Phase IA Cultural Resources Assessment
- Evaluate feasibility of and develop preliminary design of horizontal directional drill (HDD) crossings of Urbanna Creek and the Piankatank River.
- Evaluate flow control/maintenance of service alternatives at treatment plant decommissioning sites.
- Develop preliminary concepts/layouts for proposed pump stations at treatment plan decommissioning sites.
- Evaluate existing Mathews Transmission System assets and identify impacts to the existing Mathews Interceptor System and potential improvements.
- Develop hydraulic model for proposed Middlesex System and existing Mathews System.
- Develop overall project schedule (design and construction).
- Develop construction cost estimates and estimates of total project cost.

2 Program Overview

The initial phase of the Middlesex Interceptor Sewer Program includes the installation of a collection system, pump station (Cook's Corner pump station) and force main in the Cook's Corner area of Middlesex County. The proposed force main will convey flows from the Cooks's Corner Pump Station through a 3-inch diameter HDPE force main to its discharge location in an existing gravity sewer manhole in Bowden Street where it will ultimately flow to HRSD's Central Middlesex Treatment Plant. Figure 2-1 shows the approximate service area at Cook's Corner, the pump station location, and the proposed force main alignment. Phase I of the Middlesex Interceptor Sewer Program is anticipated to be constructed by the end of 2021.

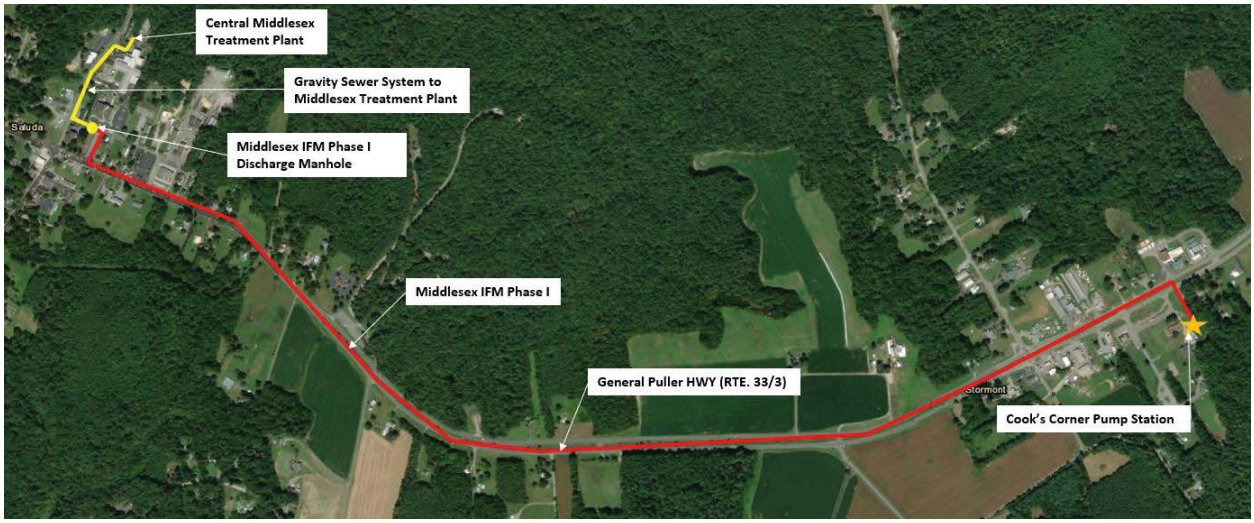


Figure 2-1: Middlesex Interceptor Sewer Program Phase I

MISPPII consists of installation of a transmission force main from the town of Urbanna to the existing Mathews transmission force main (NF-210) as well as the extension of the Middlesex Interceptor Sewer Program Phase I force main to the existing Central Middlesex treatment plant site located in Saluda. Pump stations will be installed as part of the MISPPII to convey flows from the existing collection system in Urbanna and Saluda to allow the decomissioning of the existing Urbanna and Central Middlesex treatment plants. In addition to the two pump stations installed to replace the existing treatment plants, additional pump stations will be installed along the force main alignment. These pump stations will serve to both break the hydraulic grade in the approximately 16 mile long Middlesex Transmission Force Main (MTFM) and collect flows from future service areas where collection systems are anticipated to be installed. Equalization is anticipated to be installed at the pump stations located along the proposed MTFM. Figure 2-2 provides an overview of the MISPPII improvements.

Figure 2-2: Middlesex Interceptor Sewer Program Phase II

Flows from the MTFM will ultimately be conveyed through the Mathews transmission force main south to HRSD's Gloucester interceptor force main (IFM) across the York River to the York River treatment plant. Improvements within the Mathews transmission force main system will be required in order to accommodate additional flows from the MTFM and are further discussed in section 7.

3 Data Collection

Kimley-Horn and Tetra Tech conducted research and field reconnaissance to collect data to identify the preferred force main alignment, pump station site locations and construction feasibility.

3.1 Records and Mapping

Record drawings, reports, mapping, and other data that was compiled and reviewed for this project are listed in Table 3-1.

Table 3-1: Summary of Project Data Reviewed

HRSD Record & Design Drawings	
SC-210	Mathews Transmission Force Main and Pump Stations- Contract A Pipeline
SC-210	Mathews Transmission Force Main and Pump Stations- Contract B Pump Stations
CIP Project No. MP013500	Collection System Program – Cook's Corner, January 2020
CIP Project No. MP013600	Middlesex Interceptor Force Main Phase 1- Cooks Corner, May 2020
HRSD Reports	
Report Name	**Year**
Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main (CIP MP013700): Design Criteria Development and Corridor Evaluation	2019
Middlesex County Sewer Preliminary Engineering Report MP013200	2019
Middle Peninsula Nutrient Removal Program Preliminary Engineering Report	2007
Central Middlesex Collection System Feasibility Report Phase 1 Service Areas	2014
VDOT Record Drawings	
Project Number	**State Road**
0003-059-101,C501	Route 3 & Route 33
0033-059-000 1959-03	Route 33
0033-059-000 1959-04	Route 33
0033-059-000, 682ac	Route 227 & Route 33
0033-059-000, 1243A	Route 33
0033-059-101,C501	Route 33
0033-059-106, C501	Route 33
0033-059-106, M503	Route 33
0033-059-106, RW-202, C-502	Route 33
0033-059-112 c501	Route 620 & Route 33
0033-059-V06, RW-203, C-505	Route 3 & Route 33
0003-059-000,793ac	Route 3
Middlesex County Record & Design Drawings	
Middle Peninsula Regional Security Center Wastewater Treatment Facility	
Town of Urbanna Wastewater Collection and Treatment	
Town of Urbanna, Virginia Wastewater Treatment Improvements Project- 9218	
Bethpage Camp-Resort Proposed Sanitary Sewer	
Easter Middlesex Regional Water System Phase 1B, 2, & 3A	
HRSD GIS Data	
HRSD Telog Data	

3.2 Eastern Middlesex Regional Water System Improvements Survey

Middlesex County has a proposed water system improvement project that includes a new 12-inch water main that will be constructed along Urbanna Road (Rte. 227) from a proposed water supply facility located approximately one mile south of the Town of Urbanna to the Urbanna Road (Rte. 227)/General Puller Highway (Rte. 33) intersection at Cook's Corner. From Cook's Corner the water system improvement project extends east following the same corridor as the MISPPII along Rte. 33 to Hartfield.

At the time of this report the Eastern Middlesex Regional Water System Project was fully designed with bids received by Middlesex County on August 21, 2020. Middlesex County provided HRSD with a copy of the plans and the survey for the Eastern Middlesex Regional Water System Improvement project for use

during the preliminary engineering phase and design phase of the MISPPII project in areas where the two projects are located within the same corridor.

3.3 Field Reconnaissance

Field visits were conducted to identify unique features for consideration in this evaluation and confirm the operating conditions of HRSD's Mathews transmission force main system to verify capacity to receive flows from the MISPPII. Kimley-Horn and Tetra Tech also verified the feasibility of different force main alignments, pump station sites, environmentally sensitive areas, areas of potential disruption to traffic, horizontal direction drill staging and string out locations, and public and private properties where acquisition may be required, or easement will be necessary.

Existing operating conditions within the Mathews Transmission Force Main System were analyzed using HRSD Telog data and field observations during a May 7, 2020 site visit.

4 Existing Conditions

The corridor for the force main was selected in the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main (CIP MP013700): Design Criteria Development and Corridor Evaluation prepared by Jacobs for HRSD in November 2019. The following sections detail the existing conditions within the proposed force main corridor, existing infrastructure at the existing Urbanna and Central Middlesex treatment plans, and existing infrastructure with the Mathews transmission force main system.

4.1 Force Main Corridor

The proposed force main will be installed from the Town of Urbanna to a connection point to the Mathews transmission force main (NF-210) near the intersection of Twiggs Ferry Road (Rte. 3) and Buckley Hall Road (Rte. 198) in Mathews County. Generally, the proposed force main extends from the Town of Urbanna south across Urbanna Creek and then along Urbanna Road (Rte. 227) to the intersection of Urbanna Road and General Puller Highway (Rte. 33) at Cook's Corner. From Cook's Corner the alignment proceeds east along General Puller Highway to the intersection of General Puller Highway and Grey's Point Road (Rte. 3) near Topping. The alignment continues east along General Puller Highway (Rte. 33/3) to the intersection of General Puller Highway (Rte. 33/3) and Twiggs Ferry Road (Rte. 3) in Hartfield. From Hartfield the alignment continues south along Twiggs Ferry Road across the Piankatank River to the intersection of Twiggs Ferry Road (Rte. 3) and Buckley Hall Road (Rte. 198) where the proposed force main will connect to the existing Mathews transmission force main. Figure 4-1 shows an overview of the proposed force main corridor.

Additionally, the force main installed as part of the MISPPI from the Cook's Corner PS to a discharge manhole in Bowden Street (Rte. 674) in the Saluda collection system will require extension to the Central Middlesex treatment plant site. A new pump station will be located at or adjacent to the site to convey flows from the Saluda collection system to the MTFM and allow the Central Middlesex treatment plan to be decommissioned. The MISPPI force main will be extended west along Bowden Street to the intersection of Bowden Street and Oakes Landing Road (Rte. 618). The force main alignment will continue north along Oakes Landing Road from the intersection to the existing Central Middlesex treatment plant site. Figure 4-2 shows an overview of the proposed force main corridor.

The proposed force main is anticipated to be installed primarily within the right-of-way (ROW) of the various roadways the alignment follows. The Virginia Department of Transportation (VDOT) owns and operates the roads with the proposed force main corridor.

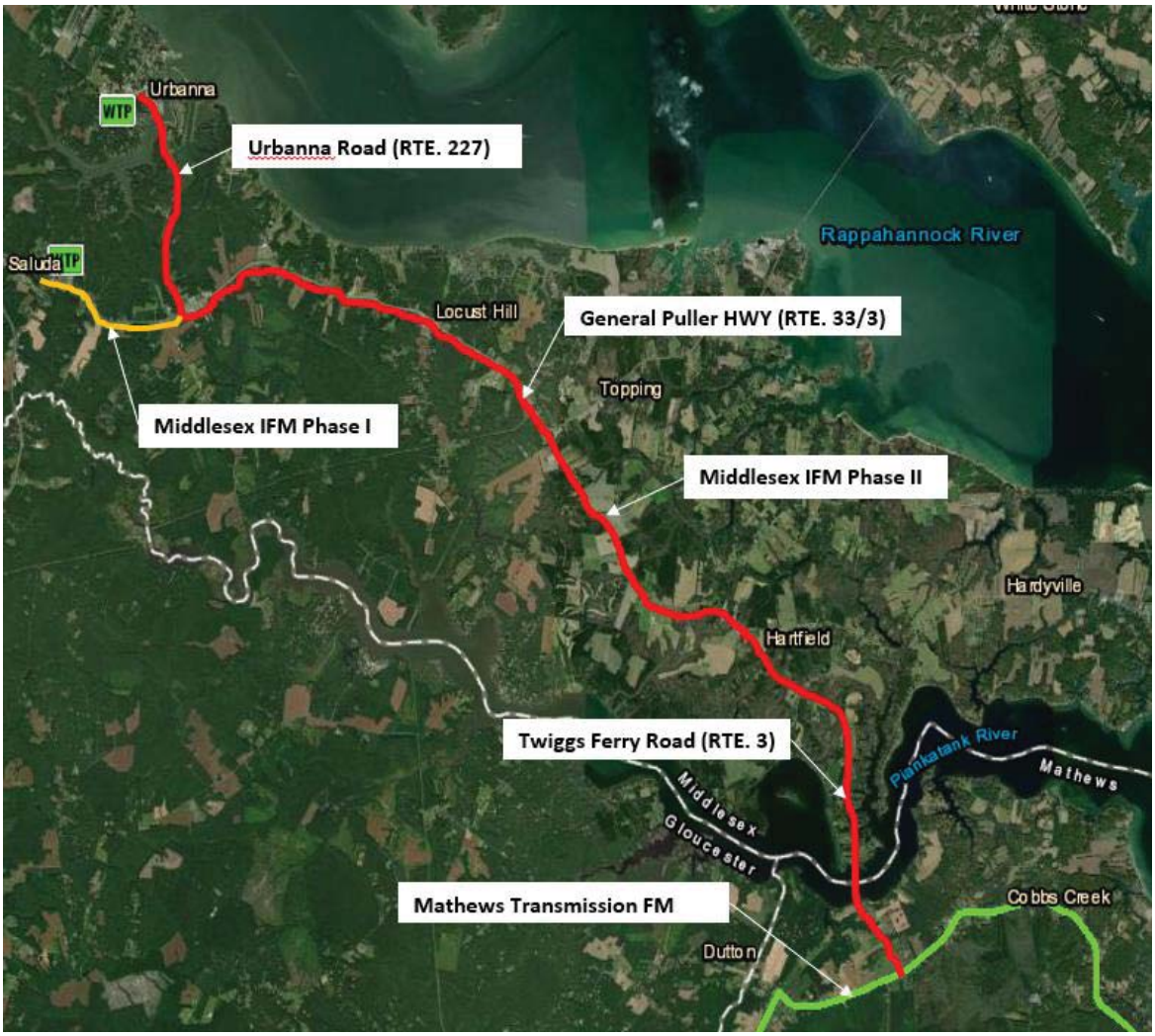


Figure 4-1: Middlesex Interceptor Sewer Program Phase II Force Main Corridor

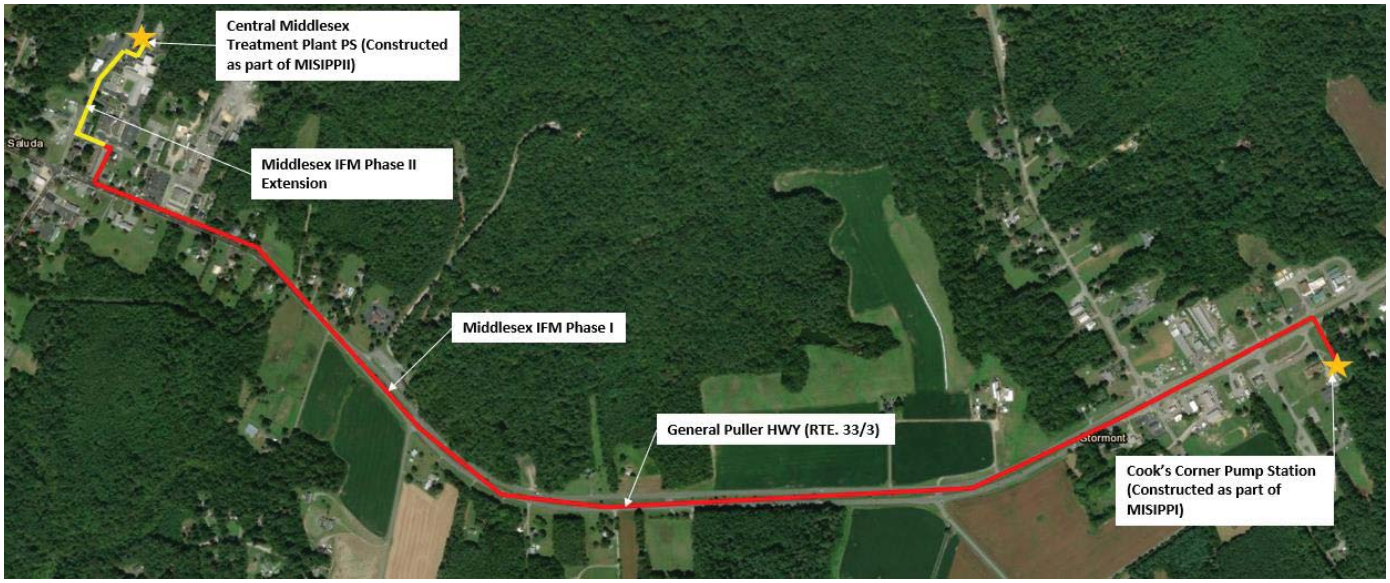


Figure 4-2: Middlesex Interceptor Sewer Program Phase I Force Main Extension Corridor

4.1.1 Town of Urbanna

The proposed force main will be routed through the Town of Urbanna from the pump station installed as part of MISPPII. Two sites were identified as potential locations for the proposed pump station and are shown in Figure 4-3. Additional discussion of the two sites is provided in section 8.2.3. The force main alignment through the town of Urbanna will be dependent on the pump station site selected. One of the site alternatives locates the proposed pump station at Tabor Park near the existing HRSD Bonner Street pump station (UB-PS-01). The other alternative site locates the pump station on a parcel adjacent to the Urbanna treatment plant.

A single force main alignment was identified for both pump station site alternatives from the intersection of Waverly Road and Laurel Hill Drive to the Urbanna Creek crossing. From the intersection, the force main alignment continues east down Waverly Road and Nimcock Road to an existing privately-owned parcel that abuts Urbanna Creek. From the parcel on Nimcock Road the force main will be horizontally directionally drilled (HDD) under Urbanna Creek to an undeveloped parcel on Urbanna Road (Rte.227) just south of the Urbanna Creek bridge. Waverly Road and Nimcock Road are residential two-way roads. Field observation indicated overhead electric/telephone/cable are present in the corridor. Figure 4-4 shows the force main corridor within the town of Urbanna and across Urbanna Creek.

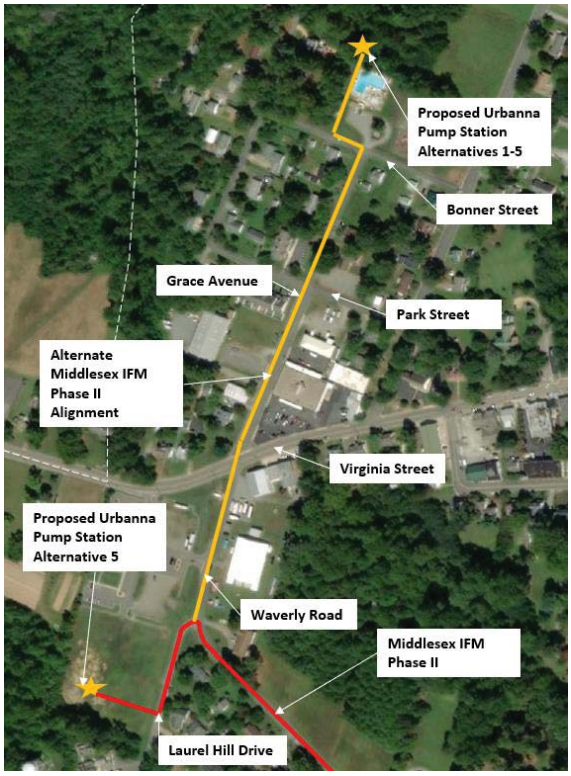


Figure 4-3: Urbanna Pump Station & Force Main Alignment Alternatives

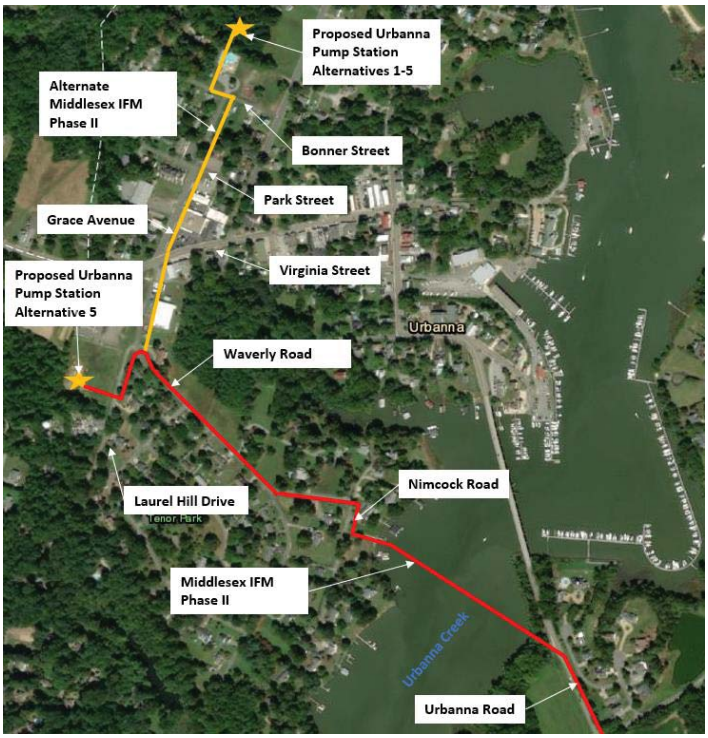


Figure 4-4: Town of Urbanna & Creek Crossing Corridor

4.1.1.1 TABOR PARK ALIGNMENT

The proposed force main alignment from the Tabor Park site would extend from the park east along Bonner Street to Grace Avenue. The force main alignment continues south along Grace Avenue across Virginia Street and continues south along Waverly Road. From the intersection of Waverly Road and Laurel Hill Drive a single force main alignment was identified for both pump station sites to cross Urbanna Creek.

Bonner Street and Grace Avenue are residential two-way roadways to the north of Park Street. A small commercial district is present along the southern portion of Grace Avenue to the intersection of Virginia Street. Field observation and record drawing review indicate the following existing utilities are present in the corridor:

- Overhead electric/telephone/cable
- Storm drain
- Water main
- Gravity sanitary sewer
- Private force main
- HRSD force main

4.1.1.2 URBANNA TREATMENT PLANT ALIGNMENT

A vacant privately owned parcel located just north of the existing HRSD Urbanna Treatment plant was identified as a potential pump station site. From the proposed pump station site, the force main alignment continues east inside an existing utility easement to Laurel Hill Drive. The proposed force main continues north along Laurel Hill Drive to the intersection of Waverly Road and Laurel Hill Drive. From the intersection a single force main alignment was identified for both pump station sites to cross Urbanna Creek.

Laurel Hill Drive is a residential two-way roadway. Field observation and record drawing review indicate the following existing utilities are present along Laurel Hill Drive:

- Overhead electric/telephone/cable
- Storm drain
- Water service line to the treatment plant
- Buried telecommunication
- HRSD force main

4.1.2 Urbanna Road (Rte. 227)

From the Urbanna Creek crossing the proposed force main will extend south approximately 2 miles within the Urbanna Road right-of-way (ROW) to the intersection of General Puller Highway (Rte. 33). Urbanna Road is a two-lane undivided highway in this area of the force main corridor. Survey data collected as part of the Eastern Middlesex Regional Water System Program indicates the Urbanna Road ROW is generally 50-feet wide through the proposed force main corridor. Figure 4-5 shows the force main corridor along Urbanna Road.

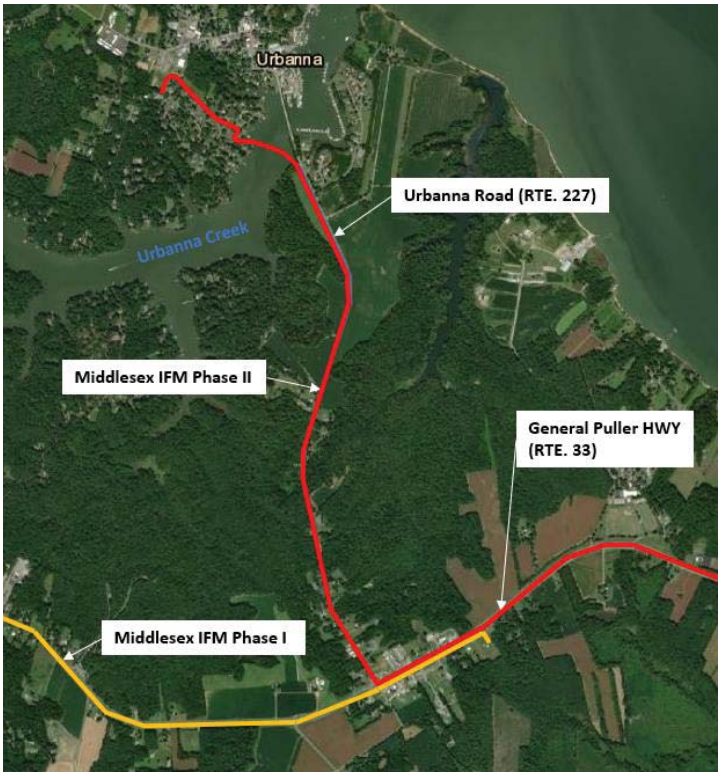


Figure 4-5: Urbanna Road Corridor

Generally, the Urbanna Road corridor consists of a mix of agricultural and residential land use in the northern portion of the force main alignment along Urbanna Road and residential land use in the southern portion of the force main alignment along Urbanna Road. A small commercial district is present near the intersection of General Puller Highway at Cook's Corner. Field observation, survey data and future construction plans indicate the following utilities and drainage features are present or will be present along the corridor during construction of the proposed force main:

- Overhead electric/telephone/cable
- Storm drain
- Water main (future improvements as part of the Middlesex Regional Water System Program on east side of Urbanna Road)
- Roadside ditches

Architectural and archaeological resources are present on parcels adjacent to the Urbanna Road ROW; however, it is not anticipated that these resources will be impacted during construction within the ROW. These sites are detailed in a preliminary cultural resources assessment completed as part of the preliminary engineering phase of the project and included in Appendix A.

4.1.3 General Puller Highway (Rte.33/Rte.3)

The proposed force main alignment proceeds approximately 8.5 miles east along General Puller Highway from Cook's Corner to Hartfield. Between the intersection of Urbanna Road (Rte. 227), in the Cook's

Corner area of Middlesex County, and the intersection of Grey's Point Road (Rte. 3) in the Topping area of Middlesex County, General Puller Highway is a four-lane divided highway with a grass median, with the exception of the Locust Hill area where approximately 4,500-feet of concrete median is present. The grass median ends approximately 1,000-feet to the east of the intersection of Grey's Point Road (Rte. 3). General Puller Highway (Rte.33/3) becomes a two-lane undivided highway with occasional middle turn-lanes to the intersection of General Puller Highway and Twiggs Ferry Road (Rte.3) in the Hartfield area of Middlesex County. Figure 4-6 shows the force main corridor along General Puller Highway.

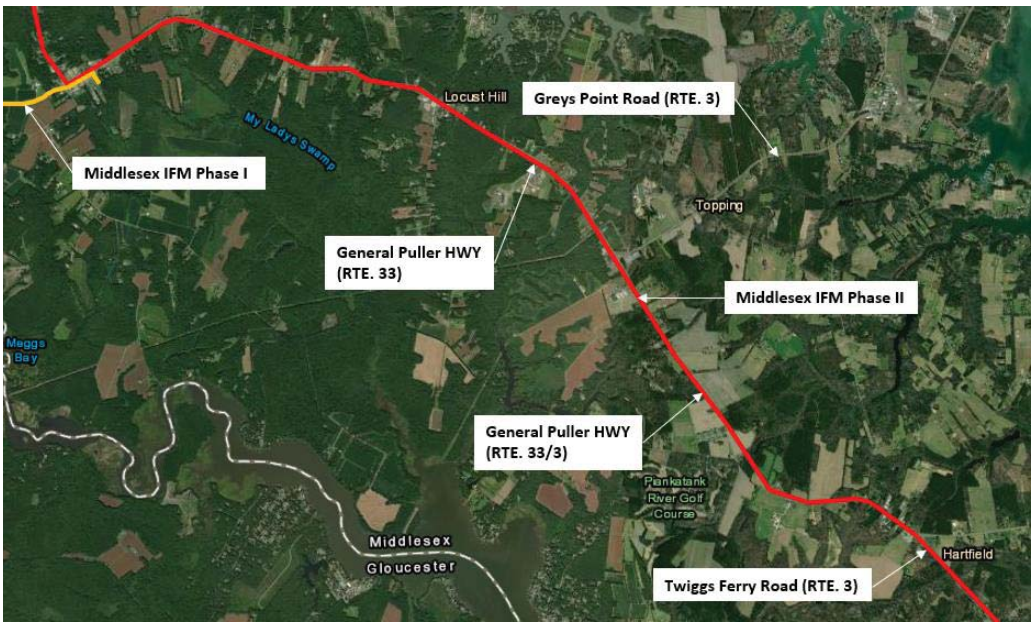


Figure 4-6: General Puller Highway Corridor

Survey data collected as part of the Eastern Middlesex Regional Water System Program indicates the ROW within the corridor varies in width. General ROW widths in various sections of the corridor are indicated in Table 4-1.

Table 4-1: General Puller Highway ROW Width

Location	ROW Width (ft)
Cook's Corner Area	120'-150'
Cook's Corner to Locust Hill	175'
Locust Hill Area	110'
Locust Hill to Topping	175'
Topping Area	175'
Topping to Hartfield	110'
Hartfield Area	110'

Generally, the corridor consists of agricultural land use with scattered residences. Most residences along the corridor are clustered in small communities present throughout the corridor. These communities include the following areas:

- Christchurch
- Locust Hill
- Topping
- Hartfield

Small commercial districts are present in some of the communities along the corridor and include the following areas:

- Christchurch
- Locust Hill
- Topping
- Hartfield

Two schools are present along General Puller Highway within the force main corridor.

- Christchurch School (located in Christchurch)
- St. Claire Walker Middle School (located between Locust Hill and Topping)

Numerous churches are also located throughout the corridor.

Field observation, survey data, record drawings and future construction plans indicate the following utilities and drainage feature are present or will be present along the corridor during construction of the proposed force main:

- Overhead electric/telephone/cable
- Buried franchise utilities
- Storm drain
- Box culverts
- Water main (future improvements as part of the Middlesex Regional Water System Program)
- Roadside ditches

Architectural and archaeological resources are present on parcels adjacent to the General Puller Highway ROW; however, it is not anticipated these resources will be impacted during construction within the ROW. These sites are detailed in a preliminary cultural resources assessment completed as part of the preliminary engineering phase of the project and included in Appendix A.

4.1.4 Twiggs Ferry Road (Rte.3)

The proposed force main alignment proceeds approximately 4.5 miles south along Twiggs Ferry Road from Hartfield to the connection point to the Mathews transmission force main at the intersection of Twiggs Ferry Road (Rte. 3) and Buckley Hall Road (Rte. 198) in Mathews County. Twiggs Ferry Road is a two-lane undivided highway from Hartfield to Buckley Hall Road. The county line between Middlesex

County and Mathews County is in the middle of the Piankatank River. Figure 4-7 shows the force main corridor along Twiggs Ferry Road.

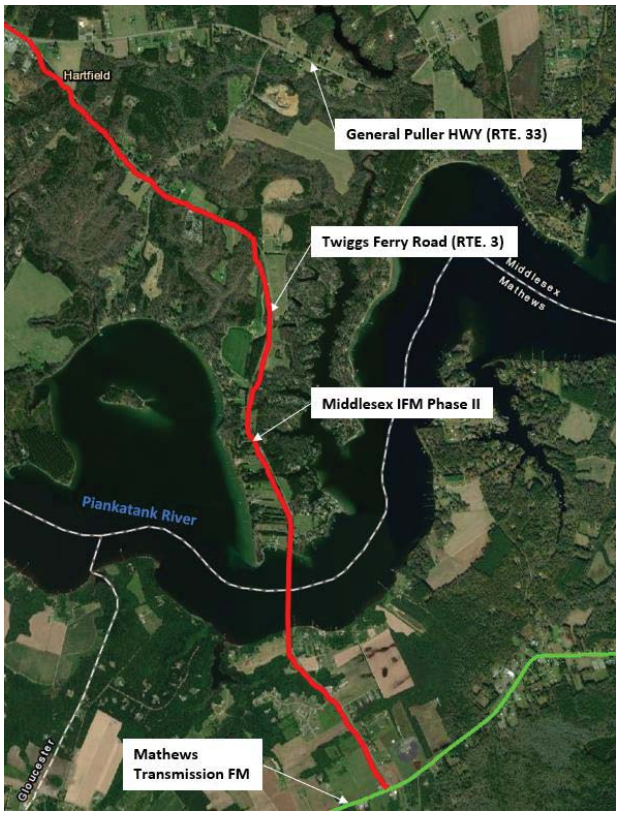


Figure 4-7: Twiggs Ferry Road Corridor

GIS data available in Middlesex County indicates there is prescriptive ROW present along Twiggs Ferry Road along much of the proposed force main alignment. In areas where there is a prescriptive ROW, parcel boundaries extend to the centerline of Twiggs Ferry Road. GIS data indicates the ROW begins approximately 1/2 mile north of the Twiggs Ferry Bridge and varies between 160 feet wide and 100 feet wide to the north of the Piankatank River. To the south of the Twiggs Ferry Bridge GIS data indicates an 80-foot wide ROW is present along Twiggs Ferry Road from the Twiggs Ferry Bridge to Buckley Hall Road. It should be noted that VODT plans for Twiggs Ferry Road indicate that a right of way was established between the Piankatank River and the General Puller Highway/Twiggs Ferry Road intersection. This will need to be confirmed during the design phase with property research.

Generally, the corridor consists of agricultural land use with scattered residences. Architectural archaeological resources are present on parcels adjacent to Twiggs Ferry Road. The historic Wilton Property is located on the west side of Twiggs Ferry Road within the corridor. The historic property is listed on the National Register/Virginia Landmarks Register and is subject to a historic preservation easement held by the Virginia Board of Historic Resources. Figure 4-8 shows the approximate limits of the historic preservation easement within the corridor. It is anticipated the proposed force main will be aligned to avoid any impacts to the property subject to the historic preservation easement during construction. Additional information regarding the Wilton Property and other architectural and

archaeological resources is included in the preliminary cultural resources assessment completed as part of the preliminary engineering phase of the project which is included in Appendix A.

Figure 4-8: Historic Wilton Property Easement

Field observation, survey data, and record drawings indicate the following utilities and drainage feature are present or will be present along the corridor during construction of the proposed force main:

- Overhead electric/telephone/cable
- Buried franchise utilities
- Storm drain
- Box culverts
- Roadside ditches

It is anticipated the force main will be installed via HDD under the Piankatank River from an open field on the west side of the Twiggs Ferry Bridge to the north of the Piankatank river to an open field located adjacent to Dixie Drive on the west side of the Twiggs Ferry Bridge to the south of the Piankatank River. Permit drawings included in Appendix B indicate a Dominion power circuit, a Verizon fiber optic cable, and a Metrocast fiber optic cable were installed along the same alignment. The drawings indicate the

cables were installed via HDD approximately 220 feet from the south side of the Piankatank and 250 feet from the north side of the Piankatank to avoid impacts to the shoreline. The drawings indicate the remainder of the alignments across the Piankatank were installed by divers and with approximately 3-feet of cover. It is anticipated the force main will be installed across the Piankatank River at a depth such that construction of the proposed force main does not impact the existing utilities.

4.2 Wastewater Treatment Plants

4.2.1 Central Middlesex Treatment Plant

The Central Middlesex Treatment Plant is located on a 0.93-acre parcel inside an approximately 0.15-acre fenced area north of the Central Middlesex Correctional Facility. The treatment plant consists of a 10,000 gallons per day (gpd) extended aeration packaged unit from Purestream Inc. with an electrical/control building, a backup generator and a storage building. The packaged

unit consists of the following:

- One (1) overload reversing and recycling type comminutor
- One (1) submerged bar screen
- One (1) 5,000 gal. surge tank
- Two (2) 80 gpm at 15-ft. Total Dynamic Head (TDH) surge pumps
- Airlift chamber with one (1) 25 gpm pump
- One (1) 10,000 gal. aeration tank with diffusers
- One (1) 1,800 gal. clarifier with a skimmer
- One (1) multi-media filter system with two (2) 60 gpm at 15-ft. TDH backwash pumps
- One (1) UV system
- One (1) sludge holding tank with a sludge return trough to the aeration tank
- One (1) 30 cfm surge tank blower
- Two (2) 51 cfm aeration tank blowers
- One (1) 30 gal. Crock and Feeder chemical feed pump
- Control Panels

The treatment plant receives raw wastewater from the correctional facility via an 8-inch ductile iron pipe (DIP) gravity sewer and discharges the treated effluent to Urbanna Creek via a 6-inch pipe.

4.2.2 Urbanna Treatment Plant

The Urbanna Treatment Plant is located on a 1.07-acre plot on Laurel Hill Drive. The treatment plant receives wastewater from the town of Urbanna and Bethpage campground via a 4-inch force main. The treatment system consists of two (2) contact stabilization package sewage treatment systems from Davco, an office/lab building, a maintenance building and shed, and a backup generator. Each package treatment system has a capacity of 50,000 gpd providing a total treatment capacity of 100,000 gpd for the plant. The treatment plant consists of the following:

- Two (2) surge tanks
- Four (4) Hydromatic SPGF-300 surge discharge pumps

- One (1) Splitter box
- The package treatment system that consists of the following:
    - Two (2) 5,600 gal. aerobic digestors
    - One (1) 12,500 gal. re-aeration tank
    - One (1) settling tank, with 12 in. diameter sludge pump with agitator
    - One (1) chlorinator system
    - One (1) 6,250 gal. contact tank
- Two (2) drying beds
- One (1) 4,000 gal. holding tank
- Two (2) UV systems

The treatment plant discharges effluent to the nearby Urbanna Creek via a 4-inch force main.

4.3 Mathews Transmission Force Main System

The Mathew Transmission Force Main system consists of an HRSD-owned collection system serving the Mathews County Sanitation District located in the Mathews Courthouse area. The collection system discharges into HRSD's Church Street pump station which subsequently discharges flows from the collection system into the Mathews transmission force main (NF-210), a 6-inch HDPE (DIPS/DR 11) force main. The force main extends from the Church Street Pump Station (MT-PS-03) along Buckley Hall Road to Windsor Road to John Clayton Memorial Highway where it extends into Gloucester County from Mathews County. NF-210 extends to the Gloucester Courthouse area where it interconnects with the Gloucester IFM (NF-188). Three pump stations with equalization are located along the Mathews transmission force main between the Church Street pump station and the connection to the Gloucester IFM (NF-188). Buckley Hall pump station is located along Buckley Hall Road. Figure 4-9 provides an overview HRSD's Mathews system.

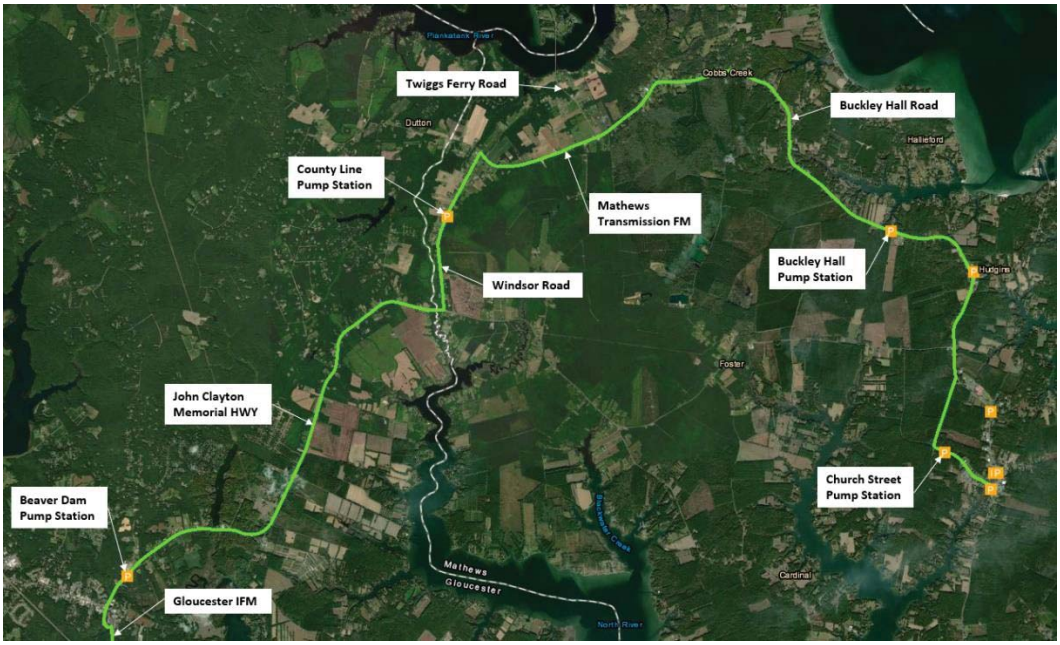


Figure 4-9: Mathews Transmission Force Main System Overview

5 Design Criteria

The MISPPII will be designed in accordance with all applicable standards and good engineering practices. Applicable HRSD Design and Construction Standards, latest revision, will be implemented into the design of the transmission force main and pump stations.

5.1 Force Main

The following assumptions were made to develop conceptual plans for the proposed force main piping that will be installed for this project:

- Ductile iron pipe and fittings will be used for pump station interior piping and site piping. Corrosion resistant internal lining shall be provided for ductile iron pipe and fittings.
- Transmission force main piping shall be HDPE.
- Force main piping installed by HDD shall be HDPE. FPVC will be considered for longer drills where longer drills may exceed the allowable pulling loads of HDPE piping.
- Minimum depth of cover for all pipelines shall be 3 feet and maximum depth of cover is 8 feet for open-cut installations with consideration for potential future development.
- It is anticipated depths in certain areas where the force main will be installed via HDD will exceed 8 feet. However, these locations will be limited to subaqueous crossings and locations where existing conflicts such as box culverts are present during land-based drilling installation.
- Pipeline materials will be selected to accommodate the maximum pressures anticipated within the transmission force main. Due to the length of the transmission force main it is anticipated sections of the proposed force main will be subjected to pressures exceeding 100 psi when pumps are operating. Pipeline materials used in directionally drilled installations will also be selected based on maximum anticipated pulling forces in addition to maximum operating pressures.
- Mainline valves will generally be provided every 4,000 to 5,000 linear feet, on each side of water crossings, and adjacent to branch connections.

Force Main Installation Methods

The proposed force main is anticipated to be primarily constructed using open trench installation method; however, certain locations may require trenchless construction methods. Trenchless construction methods anticipated for this project will include horizontal auger boring/jack and bore (with subsequent insertion of the carrier pipe) and horizontal directional drilling (HDD) of a carrier pipe.

Open Trench Construction

It is anticipated that traditional open trench construction methods will be an option to install the pipeline through most of the proposed force main corridor. The location and depth will determine the ultimate required width to provide adequate construction area to stage materials, excavate, and install the proposed force main.

Horizontal Casing Construction

A variety of methods to install horizontal casing pipes are available based on site conditions. This method is typically utilized for major road crossings, culvert crossings, and other areas where open trench construction is not feasible. Horizontal casing installation methods generally include the following: jack and bore, pipe ramming, guided auger boring, tunnel boring machine construction, and microtunneling. Tunnel boring machines and microtunneling are generally reserved for 36-inch or greater diameter installations and are not applicable to this project. Selection of appropriate methods must consider geotechnical conditions, existing overhead and underground utilities, and space for staging areas for entrance and exit pits.

Horizontal Directional Drilling

Horizontal Directional Drilling (HDD) may be used for installation of pipelines. For this project, two different HDD methods will be considered. These include conventional HDD and directional boring (min-HDD).

The more common method used by HRSD for installing HRSD force mains consists of utilizing HDD rigs rated from 40,000 lbs. to over 100,000 lbs. of thrust and pullback. These rigs require significant support equipment to include mud mixers, mud recycling units, control rigs, and medium to large drilling rigs. Staging areas can be 150 feet by 250 feet in size. These units are capable of installing larger diameter force mains well over 1,000 linear feet in length and at significant depths and are often used for stream or river crossings.

Mini-HDD systems are much smaller and may be used for shorter and shallower pipeline installations. Installation of depths of no deeper than 14 feet may be achieved with pipes up to 12-inches in diameter using drill segments less than 1,000 feet in length. Rigs typically have pull force capability of up to 30,000 lbs. Small quantities of drilling mud are necessary for lubrication, but the staging area is much smaller as there typically is no additional support equipment necessary than the drilling unit. Mini-HDD rigs should not be used in soils with significant cobbles, boulders, and obstructions greater than 4 inches in diameter. Due to the minimal number of interconnects on this project, installation by Mini-HDD is a viable option for some of the land piping segments. Pipe segments of the recommended route alternative installed by Mini-HDD will be evaluated on a case-by-case basis during the design phase of the project.

5.2 Pump Stations

The following assumptions were made to develop conceptual plans for the proposed pump stations:

- Pump stations shall meet anticipated operating conditions
- Submersible pump stations, suction lift pump stations, in-line or pressure reducing stations (PRSs) and dry pit submersible pump stations were considered.
    - Submersible pump station configuration shall be per HRSD Small Communities Design Template for new submersible pump stations.
- Pump stations shall meet the requirements of the Virginia Department of Environmental Quality Sewage Collection and Treatment (SCAT) Regulations except as noted below:
    - Peak pumping capacity of the station will be selected to provide a minimum scouring velocity of 2 feet per second in the proposed force main.

  - Pump stations will not be designed such that the pumps are capable of handling flows in excess of the expected maximum flow or a minimum of 2.5 times the average design flow whichever is greater. Instead, equalization storage will be provided to store peak flows until they can be later discharged at a controlled rate that doesn't exceed the capacity in the downstream receiving system.
- Initial operating volume selected to provide a storage time ranging from 10 to 30 minutes at average daily flow.
- Variable Frequency Drives (VFDs) will be utilized to control the discharge rate of the pumps to produce a minimum scouring velocity of 2 feet per second in the proposed force main.
- Minimum property dimensions will be 150 feet x 150 feet unless prohibited by existing site constraints.
- Equalization storage facilities to be below grade HDPE tanks or above grade steel tanks.

6 Force Main Alignment

6.1 Land Piping Installations

A meeting was held with HRSD and VDOT on April 1, 2020 to review the corridor and discuss potential locations for the new force main within the corridor. At the meeting, VDOT provided the following general guidance for the location of the proposed force main:

- VDOT generally prefers that utility installations within and parallel to the ROW be constructed outside the pavement section.
- VDOT's preferred location within the ROW (when adequate ROW is available) is to install new utilities outside of the ditch line.
- If sufficient space is not available within the ROW, then utilities may be installed outside the paved shoulder between the shoulder and the ditch line.
- Open cut of utilities is generally not permitted in paved sections but can be reviewed on a case by case basis.
- Jack and bore or other trenchless methods with casing to be used for crossing roadway and median openings.
- For HDD installations within the ROW, casings are generally required for road crossings; however, because the force main will be HDPE (continuous joint-less pipe) this requirement may be waived.
- Installation of the force main within the grass median will be reviewed and evaluated by VDOT on a case by case basis.
- Justification shall be provided for proposed utility alignments in the pavement or ROW

Based on a review of existing conditions within the corridor and guidance from VDOT, a preliminary alignment was developed for the proposed force main. This is provided on the preliminary force main alignment drawings included in Appendix C.

6.2 Subaqueous Installations

The proposed force main alignment will require two subaqueous crossings of tidal water ways, Urbanna Creek and the Piankatank River. Horizontal directional drilling is proposed to install the force main at

both crossings to reduce surface disturbance during installation. An independent feasibility study was prepared by Kimley-Horn's subconsultant, Brierley and Associates, and is included in Appendix D.

6.2.1 Urbanna Creek Crossing

The proposed force main will extend from the Urbanna pump station located in the Town of Urbanna and proceed southeast to the Urbanna Creek crossing through a residential neighborhood. The proposed alignment crosses Urbanna Creek to the west of the Urbanna Road (Rte. 227) bridge crossing Urbanna Creek. Alignment alternatives to the east of the Urbanna Road (Rte. 227) bridge were not considered due to the presence of the Rosegill property, which is listed in the National Register of Historic Places and the Virginia Landmarks Register, on the south side of Urbanna Creek to the east of Urbanna Road.

The north side of Urbanna Creek to the west of the Urbanna Road (Rte. 227) bridge crossing Urbanna Creek is lined with residential properties. Overhead power lines are present within the residential area to the north of Urbanna Creek. The southern bank of Urbanna Creek to the west of the Urbanna Road (Rte. 227) bridge crossing Urbanna Creek in the vicinity of the proposed HDD is undeveloped with an approximate 100' wide Riparian buffer along the shoreline with an open field to the south. Overhead power lines are present along the west side of Urbanna Road to the south of Urbanna Creek.

U.S. Geological Survey (USGS) topographic data in the area the elevations range from an elevation of approximately + 20 feet along Nimcock Road on the northern bank to an elevation of approximately + 35 feet at the top of the southern bank. Maximum depth of Urbanna Creek along the proposed force main alignment is approximately 10 feet.

It is anticipated string-out for the HDD will have to occur on the southside of Urbanna Creek, as no viable corridor is present within the residential area on the north side of Urbanna Creek to accommodate string-out of the approximately 2000 linear foot pipeline required for the crossing. As a result, it is anticipated the drill rig for the HDD installation will be located on the north side of the Urbanna Creek crossing. An existing boat ramp on the north side of Urbanna Creek was identified as a potential location for staging the HDD drill rig to avoid impacts to residential properties. It is anticipated both permanent and temporary easement will be required on the northside of Urbanna Creek for the HDD installation.

In order to avoid compound curvature along the drill alignment and avoid potential inadvertent returns during HDD installation along the steep southern bank of Urbanna Creek, the proposed entrance pit for pipeline pull back is located approximately 800 feet back from Urbanna Creek. The location of the proposed force main HDD exit point was coordinated with the future Rosegill development (south side of the crossing) to avoid any future conflicts if development moves forward. Pipeline string-out on the south side of Urbanna Creek is anticipated to be located on the west side of Urbanna Road. It is anticipated both permanent and temporary easement will be required on the southside of Urbanna Creek for the HDD installation.

A plan view showing the proposed crossing and easement requirements is included in Appendix C.

For this crossing, 10-inch HDPE (DIPS/DR7) is proposed which will provide a factor of safety of approximately 3.2 against failure during pullback. 8-inch Fusible PVC (FPVC) (DIPS/DR14) would also be a suitable material choice for this crossing.

6.2.2 Piankatank River Crossing

On the north side of the Piankatank an open field is present on the west side of the Twiggs Ferry Road. A dirt road extends to the Piankatank River on the east side of Twiggs Ferry Road with a residential property located just east of the dirt road. On the south side of the Piankatank River residential parcels are present on both the east and west side of Twigs Ferry Road adjacent to the Piankatank River. An open field is present just south of the residence located on the west side of Twiggs Ferry Road south of the Piankatank.

U.S. Geological Survey (USGS) topographic data in the area indicates the elevations range from +3 feet at the HDD entry area (north side) to about +39 feet at the HDD exit (south side). The maximum depth of the Piankatank River along the proposed force main alignment is approximately 35-feet.

Due to space constraints and in order to avoid the need for easements from multiple residential properties, the use of the east side of the Twiggs Ferry Road bridge was eliminated from consideration.

It is anticipated that the drill rig will be staged in the open field on the north side of the crossing and pipe string-out will be done on the south side of the crossing along Twiggs Ferry Road. In order to minimize the risk of inadvertent returns during HDD installation along the steep southern riverbank, the proposed entrance pit for pipeline pull back is located approximately 500 feet back from the river. It is anticipated both permanent and temporary easement will be required on both sides of the river for the HDD installation.

A plan view showing the proposed crossing and easement requirements is included in Appendix C.

For this crossing, 8-inch FPVC (DIPS/DR14) is proposed which will provide a factor of safety of approximately 2 against failure during pullback. HDPE was eliminated from consideration due to the length of the crossing which contributed to a factor of safety of 1.4 against failure during pullback.

6.2.2.1 CYCLIC FATIGUE ANALYSIS-FPVC

Fatigue failure resulting from internal cyclic loading in sewer force main applications (commonly from oscillating internal pressures) is a known risk to PVC pipe. A cyclic fatigue analysis was performed for the segment of FPVC proposed for the Piankatank River crossing and is included in Appendix E. Based on the analysis the predicted cycles to failure exceeds the total number of anticipated cycles during the life cycle (both 50 years and 75 year life cylces were considered) of the pipeline. As a result, the 8-inch FPVC (DIPS/DR14) is sufficient pipe material to withstand the anticipated cyclical loading at the Piankatank River crossing.

7 Hydraulic Analysis

A hydraulic analysis was performed to identify the proposed infrastructure required as part of MISPPII to accommodate projected sanitary sewer flows from Middlesex County. The analysis included identifying impacts of conveying additional sanitary sewer flows into the existing downstream Mathews transmission force main system. As part of the analysis, limitations of the existing Mathews transmission force main system were identified.

7.1 Flow Projections

HRSD provided flow projections for service areas within Middlesex County anticipated to be served by the MISPPII force main. Service areas contributing flows to the MISPPII force main were identified in the Middlesex County Sewer Preliminary Engineering Report MP013200 prepared for HRSD in August 2019.

Initial flow projections provided by HRSD were compared to 2019 HRSD Telog flow data from at existing monitoring sites. Flow data available at the following sites in Middlesex County were used in the analysis:

- Urbanna Treatment Plant
- Bethpage Campground
- Bonner Street Pump Station

After reviewing the flow projections for existing conditions with HRSD (see July 8, 2020 meeting summary notes), it was determined that the existing flow projections required adjustment to better align with available Telog flow data. Anticipated flows in 2025, 2030 and 2040 (full build-out condition) were developed based on information available at the time of this report regarding the likelihood and timing of future flows within contributing service areas being conveyed into the MISPPII force main. Due to the level of uncertainty of the quantity and timing of future flows, the projected flows anticipated in 2030 were utilized for the preliminary design of the MISPPII system with consideration for future improvements to the system to convey 2040 flows (full build-out condition). A summary of the flow projections for Middlesex County is presented in Table 7-1. Appendix F provides the HRSD projections for the anticipated 2030 flows and 2040 flows (full buildout).

In addition to flows from Middlesex County, the Mathews transmission force main system will also continue to convey flows from Mathews County. Table 7-2 includes existing flows based on 2019 Telog data collected at the Church Street pump station in Mathews County and the future build-out flow projections provided by HRSD. Table 7-3 provides the total projected 2030 flows from Middlesex County and Mathews County.

Table 7-1: Middlesex County Flow Projections

Middlesex Contributing Sewer Shed	2020 - Existing		2030				2040 Full Build Out	
	Average (gpd)	Peak (gpd)	Average (gpd)	Peak (gpd)	Average (gpm)	Peak (gpm)	Average (gpd)	Peak (gpd)
Kilmer Peninsula			**27,450**	**68,625**	**19**	**48**	34,950	87,375
Town of Urbanna	46,491	95,293	**46,491**	**95,293**	**32**	**66**	46,491	95,293
Bethpage Campground			**63,700**	**159,250**	**45**	**111**	111,700	286,750
Central Middlesex/Saluda	13,968	36,000	**13,968**	**36,000**	**10**	**25**	25,588	70,860
Cook's Corner	10,600	30,000	**14,250**	**40,425**	**10**	**28**	19,800	56,775
Christ Church			**11,750**	**34,875**	**8**	**24**	11,750	34,875
Locust Hill			**12,000**	**31,500**	**8**	**22**	13,800	36,900
Topping			**65,420**	**166,475**	**45**	**116**	95,420	203,975
Deltaville			**73,050**	**182,625**	**51**	**127**	160,050	400,125
Hartfield			**7,800**	**23,100**	**5**	**16**	9,000	26,250
Subtotal Middlesex (gpd)	71,059	161,293	**335,879**	**838,168**	-	-	528,549	1,299,178
Subtotal Middlesex (gpm)	49	112	**233**	**582**	**233**	**582**	367	902

Table 7-2: Mathews County Flow Projections

Mathews Contributing Sewer Shed	2020 - Existing		2030 Full Build Out	
	Average	Peak	Average	Peak
Mathews (gpd)	54,576	109,152	100,000	250,000
Mathews (gpm)	38	76	69	174

Table 7-3: Total 2030 Projected Flows for Middlesex County & Mathews County

Contributing Sewer Shed	2030		2030	
	Average (gpd)	Peak (gpd)	Average (gpm)	Peak (gpm)
Middlesex	**335,879**	**838,168**	**233**	**582**
Mathews	**100,000**	**200,000**	**69**	**174**
Total	**425,079**	**1,038,168**	**302**	**756**

7.2 Mathews Transmission Force Main System

As part of the preliminary engineering phase of the MISPPII, analysis of the Mathews transmission force main system was completed to identify capacity within existing system to convey the additional flows from the MISPPII service area. Alternatives to provide sufficient capacity within the Mathews system were also developed and coordinated with HRSD.

Analysis of the existing operating conditions within the Mathews transmission force main system was completed to identify capacity within existing system downstream of the interconnection location of the MISPPII and to determine the impacts of additional flows and higher head conditions on the Buckley Hall PS. It was determined using HRSD Telog data, field observations and discussion with HRSD operations staff, the existing pumps at the Buckley Hall, County Line, and Beaver Dam pump stations are VFD controlled to operate at a set point of 190 gpm to 200 gpm.

The HRSD-Urbanna to Mathews Transmission Force Main Preliminary Flow Projections and Mathews Capacity Analysis memorandum provided to HRSD on July 4, 2020 (revised December 16, 2020) provided a summary of the hydraulic analysis of the existing Mathews Transmission force main system. The memorandum includes an evaluation of how the current system operates, impacts to the existing Mathews Transmission force main system if the MISPPII force main were tied in directly to the Mathews Transmission force main, and capacity of the existing Mathews transmission force main to convey projected 2030 Middlesex and Mathews flows. The memorandum is included in Appendix G.

Based on the hydraulic analysis performed on the existing Mathews transmission force main system it was determined that interconnection of the MISPPII force main, discharging at 300 gpm directly into the Mathews transmission force main at the intersection of Twigg's Ferry Road (Rte. 3) and Buckley Hall Road (Rte. 198) would result in the full speed operating point at the upstream Buckley Hall pump station being reduced from 240 gpm at 330 feet of total dynamic head (TDH) to 131 gpm at 378 feet of TDH, as shown in Figure 7-1.

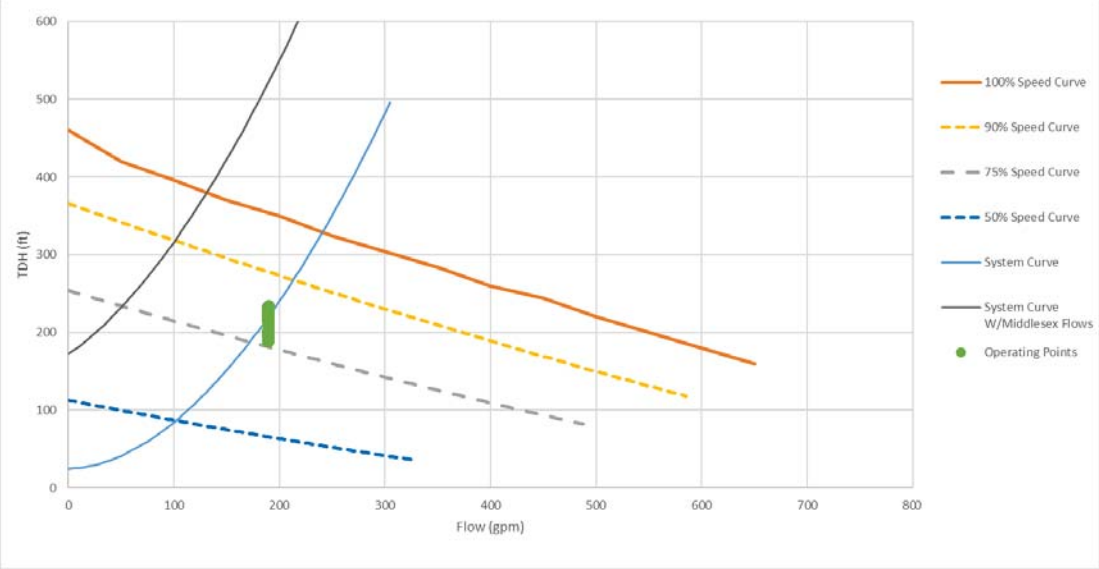


Figure 7-1: Buckley Hall Pump Station Operation

At a full speed operating point of 131 gpm the resulting velocity in the existing 6-inch HDPE (DIPS/DR 11) force main would be approximately 1.7 feet per second (fps) which is below the recommended minimum scouring velocity of 2 fps. As a result of the decreased velocities within the Mathews transmission force main upstream of the proposed connection between the Middlesex and Mathews system force mains, a scenario was evaluated with a new pump station breaking hydraulic grade in both the Mathews and Middlesex force mains near the intersection of Twigg's Ferry Road (Rte. 3) and Buckley Hall Road (Rte. 198).

A capacity analysis was performed assuming the installation of a new pump station at the intersection of Twigg's Ferry Road (Rte. 3) and Buckley Hall Road (Rte. 198). This new pump station would be used to break hydraulic grade in both the Mathews and Middlesex force mains. Based on this analysis, the existing 6-inch HDPE (DIPS/DR 11) force main between the proposed pump station and the existing County Line pump station would have the capacity to support up to 510 gpm without exceeding the pressure rating of the existing pipe (200 pounds per square inch (psi) for DR11 HDPE). A 10-psi buffer was considered; therefore, the capacity was determined by observing the flow rate as the pressure reached 440 feet. Further discussion of the scenario with a new pump station breaking hydraulic grade in both the Mathews and Middlesex force mains near the intersection of Twigg's Ferry Road (Rte. 3) and Buckley Hall Road (Rte. 198)is included in section 7.3.2. Capacity of the force main between the Buckley Hall pump station and the anticipated connection point of the MISPPII force main was also reviewed while 300 gpm was being conveyed through the Middlesex system.

Capacity of the existing Mathews transmission force main system downstream of the County Line pump station was also analyzed. A system curve was developed using HRSD record drawings of the Mathews transmission force main system to identify maximum pumping capacity at the County Line pump station and to calibrate the force main piping's Hazen Williams roughness coefficient (C-factor) utilized in the hydraulic model developed for the Mathews System. Figure 7-2 provides the County Line pump station operation.

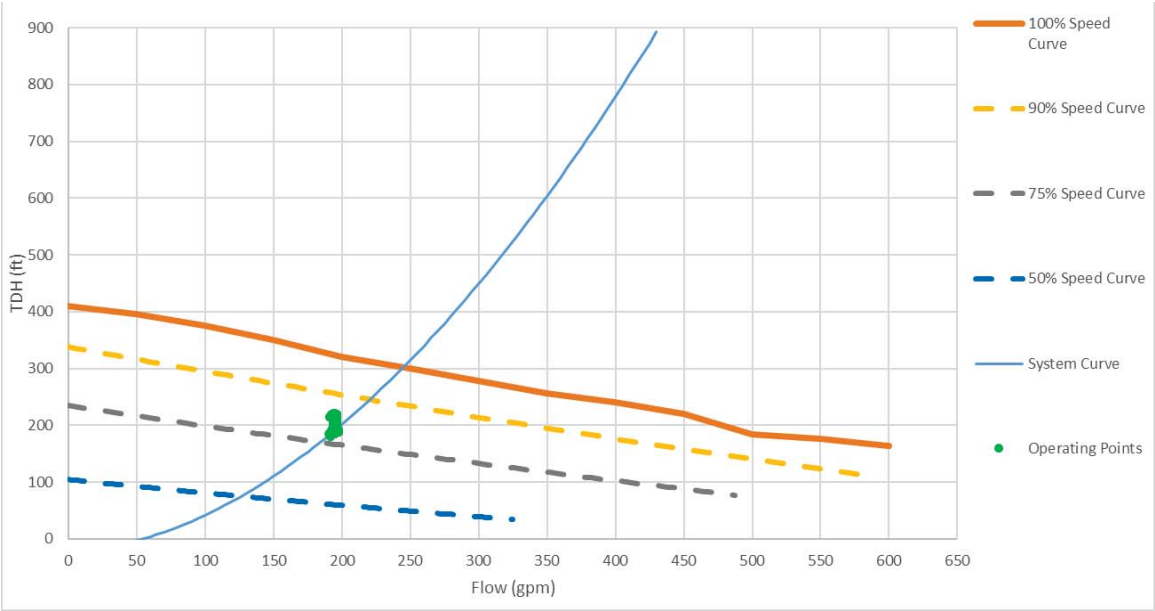


Figure 7-2: County Line Pump Station Operation

A capacity analysis of the existing 6-inch HDPE (DIPS/DR 11) force main between the County Line pump station and the existing static head structure located between the County Line pump station and the Beaver Dam pump station indicates the force main is capable of conveying up to 290 gpm without exceeding the pressure rating of the pipeline based on a Hazen Williams roughness coefficient (C-factor) of 125 and up to 305 gpm based on a C-factor of 130. It should be noted, using HRSD Telog data the C-factor within the force main between County Line and Beaver Dam pump station was calibrated between 125 and 130. Similar to the previous analysis a 10-psi buffer was considered; therefore, the capacity was determined by observing the flow rate as the pressure reached 440 feet.

Capacity of the force main between the static head structure and the Beaver Dam pump station was also analyzed. There is approximately 4,065 feet of piping downstream of the static head structure connecting to the above ground wet well at the Beaver Dam pump station. The static head structure is located at approximately elevation 77 and the high-water level (pump on) in the Beaver Dam pump station above ground wet wells is at approximately 25 feet of elevation. The 52 feet of elevation difference and a Hazen Williams roughness coefficient (C-factor) of 130 was utilized to calculate a theoretical maximum flow of 320 gpm through this section of pipeline. However, based on conversations with HRSD the static head structure is currently being bypassed and has never been utilized to HRSDs knowledge. The maximum calculated capacity of the force main between County Line pump station and Beaver Dam pump station without exceeding the pressure rating of the pipeline is similar regardless of whether the static head structure is bypassed or utilized.

The hydraulic model developed for the Mathews transmission force main system was utilized to identify pumping capacity at the Beaver Dam pump station and the 6-inch HDPE (DIPS/DR 11) force main between the Beaver Dam pump station and the interconnection to the Gloucester IFM. The analysis indicated at full speed the Beaver Dam pumps operate at 325 gpm at 100 feet of TDH under minimum dry weather head conditions and 273 gpm at 111 feet of TDH under maximum dry weather head conditions in the

Gloucester IFM. Figure 7-3 and Figure 7-4 show the Beaver Dam pump station operation under minimum and maximum dry weather head conditions in the Gloucester IFM. The analysis also indicated the force main between the Beaver Dam pump station and the interconnection to the Gloucester IFM is capable of conveying up to 720 gpm without exceeding the pressure rating of the pipeline under maximum dry weather head conditions in the Gloucester IFM. Similar to the previous analysis a 10-psi buffer was considered; therefore, the capacity was determined by observing the flow rate as the pressure reached 440 feet.

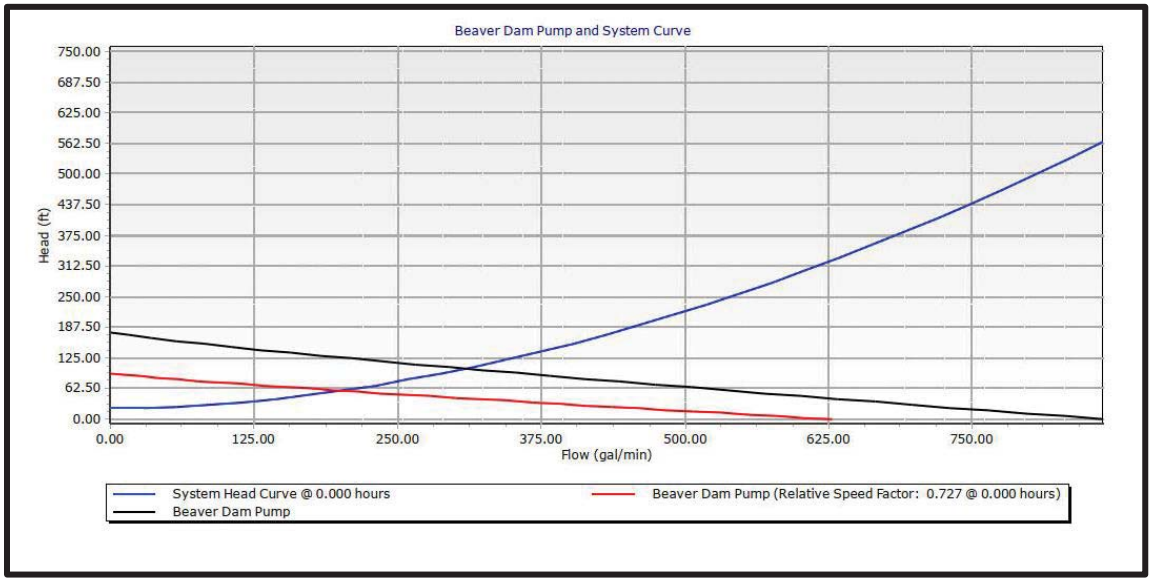


Figure 7-3: Beaver Dam Pump Station Operation Under Minimum Dry Weather Head Conditions

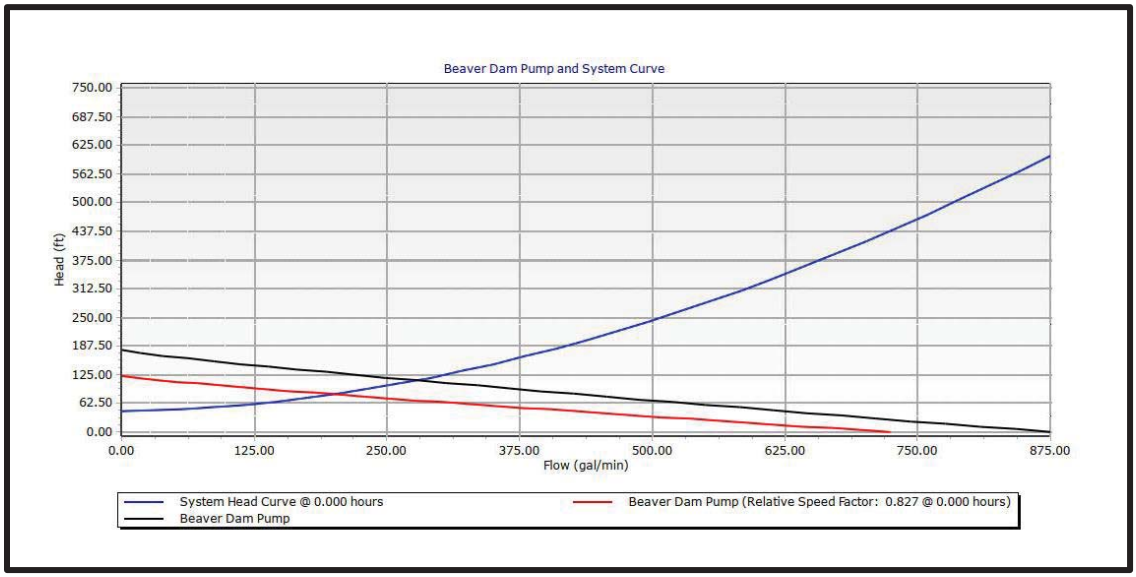


Figure 7-4: Beaver Dam Pump Station Operation Under Maximum Dry Weather Head Conditions

Table 7-4 summarizes the capacity calculated at each existing downstream pump station and within various segments of the existing Mathews transmission force main.

Table 7-4: Mathews Transmission Force Main Downstream Capacity

Pump Station or Force Main Section	Maximum Capacity (gpm)
6" HDPE (DIPS/DR 11) FM From New Pump Station (Twiggs Ferry) to County Line Pump Station (with hydraulic break at connection)	510
6" HDPE (DIPS/DR 11) FM From Buckley Hall Pump Station to MISPPII Tie-in (no hydraulic break)	180
County Line Pump Station	245
6" HDPE (DIPS/DR 11) FM From County Line PS to Beaver Dam PS bypassing or flowing through static head structure	290*-305**
6" HDPE (DIPS/DR 11) Piping from Static Head Structure to Beaver Dam PS	320
Beaver Dam Pump Station	273*** 325****
6" HDPE (DIPS/DR 11) FM From Beaver Dam PS to Gloucester IFM Tie In	720

*C-Factor= 125

**C-Factor=130

***Maximum dry weather conditions at Gloucester IFM connection

****Minimum dry weather conditions at Gloucester IFM connection

7.3 Middlesex Interceptor System Program Phase II Improvements

In order to analyze the MISPPII system a steady state hydraulic model was developed using Bentley's SewerCad Connect edition. Flow projections identified in section 7.1 and the proposed force main alignment through the MISPPII corridor were utilized to develop the hydraulic model. The objectives for the modeling effort were as follows:

- Evaluate hydraulic conditions in the force main such as velocity and pressure for a variety of pipe diameters and materials
- Evaluate the spacing and location for the different pump stations and determine preliminary pump design points
- Evaluate the impacts to the force main with other service areas connected to the force main

The following assumptions were used in the development of the hydraulic model.

- Hazen Williams friction coefficient (C-factor) of 150 for new HDPE piping
- Hazen Williams friction coefficient (C-factor) of 130 for new HDPE piping

- A pumping rate of 300 gpm through the corridor was identified to exceed projected 2030 average daily flows from Middlesex County and meet minimum recommended scouring velocities within the proposed force main.

7.3.1 Force Main Sizing

The hydraulic model was utilized to identify the size of the proposed MISPPII force main. Force main capacity was analyzed to ensure projected average day full buildout flow rates from Middlesex County could be conveyed through the MISPPI force main without exceeding the pressure limitations of the pipeline material. Two force main sizes were considered for the MISPPI force main from Urbanna to the interconnection with the Mathews transmission force main. This included 6-inch HDPE (DIPS/DR 11) and 8-inch HDPE (DIPS/DR 11). Analysis indicated that the additional head loss in a 6-inch HDPE (DIPS/DR 11) compared to 8-inch HDPE (DIPS/DR 11) caused by the smaller inside diameter of the pipeline would limit capacity within the approximately 85,000 linear foot force main due to the pressure limitations of the pipeline material. If a 6-inch HDPE force main was used, it would require additional pump stations along the force main corridor to reduce system pressures in order to convey future projected flows. As a result, 8-inch HDPE (DIPS/DR 11) was utilized for the force main material throughout the corridor.

Table 7-5 provides the limiting capacity of the 8-inch HDPE (DIPS/DR 11) force main piping which has a pressure rating of 200 psi within various sections of the MISPPI system. A 10-psi buffer was considered; therefore, the capacity was determined by observing the flow rate as the pressure reached 440 feet.

Table 7-5: MISPPII Force Main Capacity

Pump Station	Max Pump Rate (gpm)	Location of Highest Pressure
Urbanna	625	3,800 LF downstream of Pump Station
Locust Hill	965	At Pump Station
Hartfield	880* 390**	At Pump Station

*Capacity if pump station and hydraulic break is installed at the interconnection of the MISPPII force main and the Mathews force main
**Capacity if no new pump station is installed at the connection of the two systems and Buckley Hall pump stations existing pumps operate at 85 gpm (based on anticipated operating point when Hartfield operates at 390 gpm) when Hartfield PS is operating. HDPE pipe with higher pressure rating or larger diameter maybe required between Hartfield and the connection of the two force mains if Buckley Hall pumps are upgraded in the future to maintain existing pumping rates with increased discharge from the MISPPII system under full build out flow conditions.

Due to the pullback forces required for the proposed HDD crossings of Urbanna Creek and the Piankatank River it was determined pipeline material stronger than DR 11 HDPE would be required. Materials with similar inside diameters to 8-inch HDPE (DIPS/DR 11) were considered, including 10-inch HDPE (DIPS/DR 7) and 8-inch FPVC DR 14. Further discussion of HDD pipeline materials is included in section 6.2.

Velocities within the proposed MISPPII force main were evaluated to ensure that a recommended minimum scouring velocity of 2.0 fps would be maintained throughout the MISIPPI force main at the anticipated pump rate of 300 gpm. Table 7-6 indicates the anticipated velocities within the various force main sizes and materials considered for the MISPPII force main.

Table 7-6: MISPPII Force Main Velocities (at 300 gpm)

Force Main Size & Material	Velocity (fps)
8-inch HDPE (DIPS/DR 11) (7.3" ID)	2.30
10-inch HDPE (DIPS/DR 7) (7.7" ID)	2.07
8-inch FPVC DR 14 (7.7" ID)	2.07

It should be noted improvements will be required if full build-out (2040) flows are reached. In addition to pump upgrades, it is anticipated force main improvements will be required within the Mathews system between Buckley Hall pump station and the connection of the MISPPII force main to accommodate system pressures required to convey average daily full build-out flows if a pump station with a hydraulic break is not installed at the convergence of the two systems. Further discussion and final determination of the pipeline DR rating and pipe diameter between the Hartfield pump station and the connection of the MISPPII force main and the Mathews force main will be completed during the design phase.

7.3.2 Pump Station Siting

The proposed MISPPII force main from Urbanna to the interconnection to the Mathews transmission force main is approximately 16 miles long, with contributing service areas entering the force main at various locations throughout the corridor. In order to convey flows through the 16-mile corridor without having to overcome excessive pressures created due to frictional losses in the small diameter pipeline, the installation of additional pump stations along the corridor will be required.

Various pump station styles were considered to limit upstream pressures within the force main. The two categories of pump station types considered included in-line PRSs and stations with wet wells, including submersible stations, suction lift stations, and dry pit submersible stations, where the force main will discharge to a gravity system at atmospheric pressure before entering the wet well of each station.

Utilizing inline PRSs would require each service area along the corridor to pump sewage into the force main from a dedicated pump station. In service areas along the force main where a PRS is required an additional pump station would be needed to discharge flows from the service area collection system into the MISPPII force main. In comparison, breaking the hydraulic grade and allowing flows through the MISPPII force main to enter a wet well before being pumped allows the pump stations along the MISPPII force main to both convey flow through the MISPPII force main corridor and to receive and pump local service area flows. As a result, PRSs style pump stations were eliminated from further consideration for pump stations along the MISPPII force main. Section 8.1 includes further discussion of pump station styles considered.

The hydraulic model was utilized to identify the number and location of pump stations necessary to convey flow at 300 gpm downstream in the MISPPII force main without generating excessive system pressures which could limit future connections or limit options for pipeline materials. As part of the siting effort possible pump station sites were identified within proposed service areas, where possible, to allow for gravity collection or low-pressure grinder pump systems serving the service area to discharge into the proposed pump station wet well.

Three alternatives were developed for the number and location of pump stations located along the corridor. In each alternative three other pump stations were modeled along the project corridor all of which tie directly into the MISPPI force main. These pump stations include the Cook's Corner Pump Station (to be constructed as part of MISPPI), a pump station serving the Christchurch service area, and a pump station serving the Topping service area. All of the alternatives evaluated require upgrades to the Mathews system downstream of the interconnection of the MISPPII force main and the Mathews force main.

The three pump station location alternatives included:

- Middlesex Pump Stations Alternative 1 – Pump Station at Hartfield and at interconnection of MISPPII force main and Mathews Force Main
- Middlesex Pump Stations Alternative 2 – No pump station at Hartfield and at interconnection of MISPPII force main and Mathews Force Main
- Middlesex Pump Stations Alternative 3 – Pump Station at Hartfield and no pump station at interconnection of MISPPII force main and Mathews Force Main

The first alternative included four pump stations along the corridor discharging flows into the MISPPII force main. Pump stations in this alternative were located at Urbanna, Locust Hill, Hartfield, and at the connection point of the MISPPII force main and the Mathews transmission force main. Each pump station represents a hydraulic break in the system (hydraulic grade is broken in both the MISPPII force main and the Mathews transmission force main at the pump station located at the connection point), where each section of force main will discharge into a gravity system discharging to the wet well of the next pump station. Figure 7-5 shows the hydraulic grade line along the force main through the MISPPII corridor with four pump stations along the force main between Urbanna and the connection to the Mathews transmission force main.

The second alternative included three pump stations along the corridor discharging flows into the MISPPII force main. The second alternative evaluated was identical to the first alternative except no pump station was located at Hartfield. Pump stations in this alternative were located at Urbanna, Locust Hill, and at the connection point of the MISPPII force main and the Mathews transmission force main. Figure 7-6 shows the hydraulic grade line along the force main through the MISPPII corridor with three pump stations along the force main between Urbanna and the connection to the Mathews transmission force main.

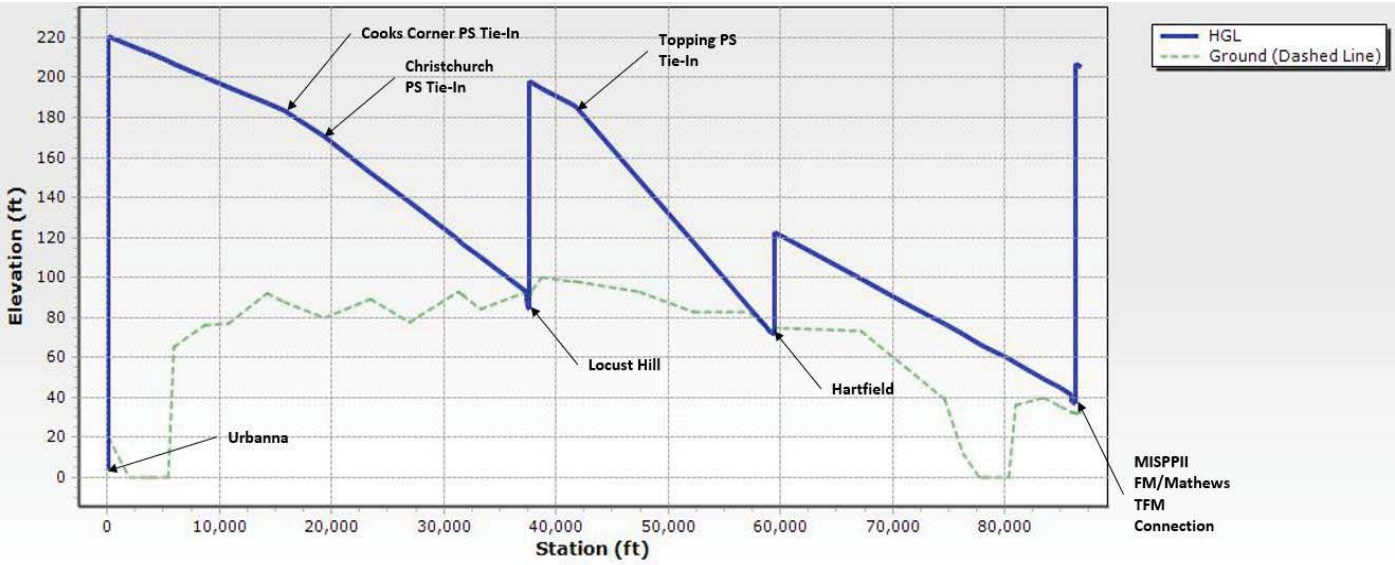


Figure 7-5: Pump Station Locations Alternative-1 Hydraulic Grade Line

The third alternative included three pump stations along the corridor discharging flows into the MISPPII force main. The third alternative evaluated was identical to the first alternative except no pump station was located at the interconnection of the Middlesex force main and the Mathews force main. Pump stations in this alternative were located at Urbanna, Locust Hill, and Hartfield with the MISPPII force main directly connecting to the Mathews transmission force main. Figure 7-7 shows the hydraulic grade line along the force main through the MISPPII corridor between Urbanna and the connection to the Mathews transmission force main.

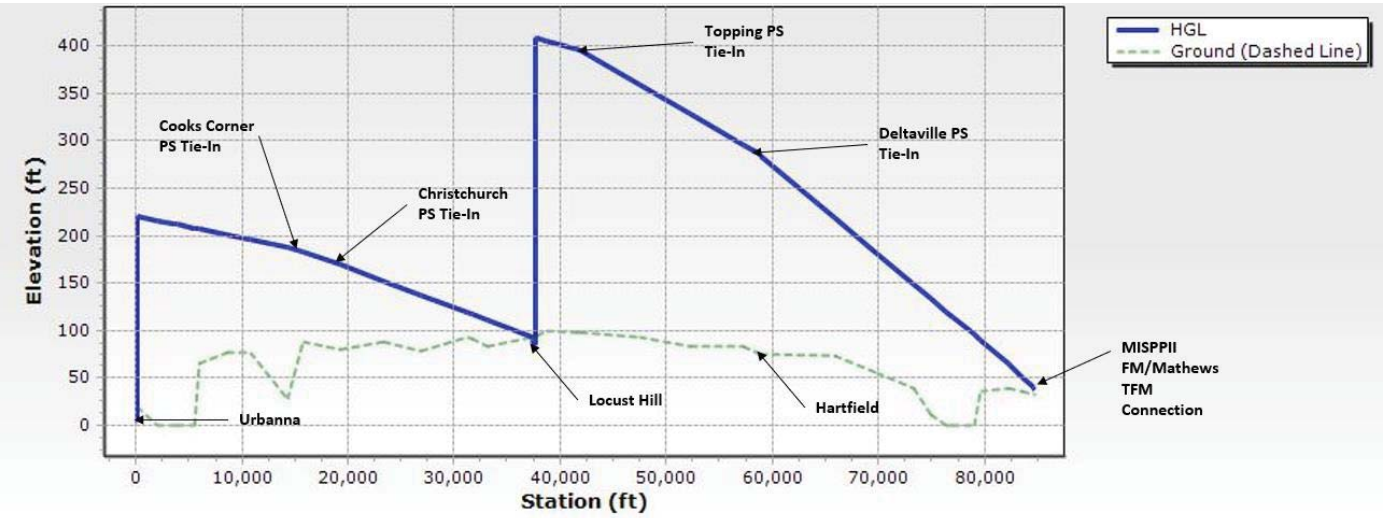


Figure 7-6: Pump Station Locations Alternative-2 Hydraulic Grade Line

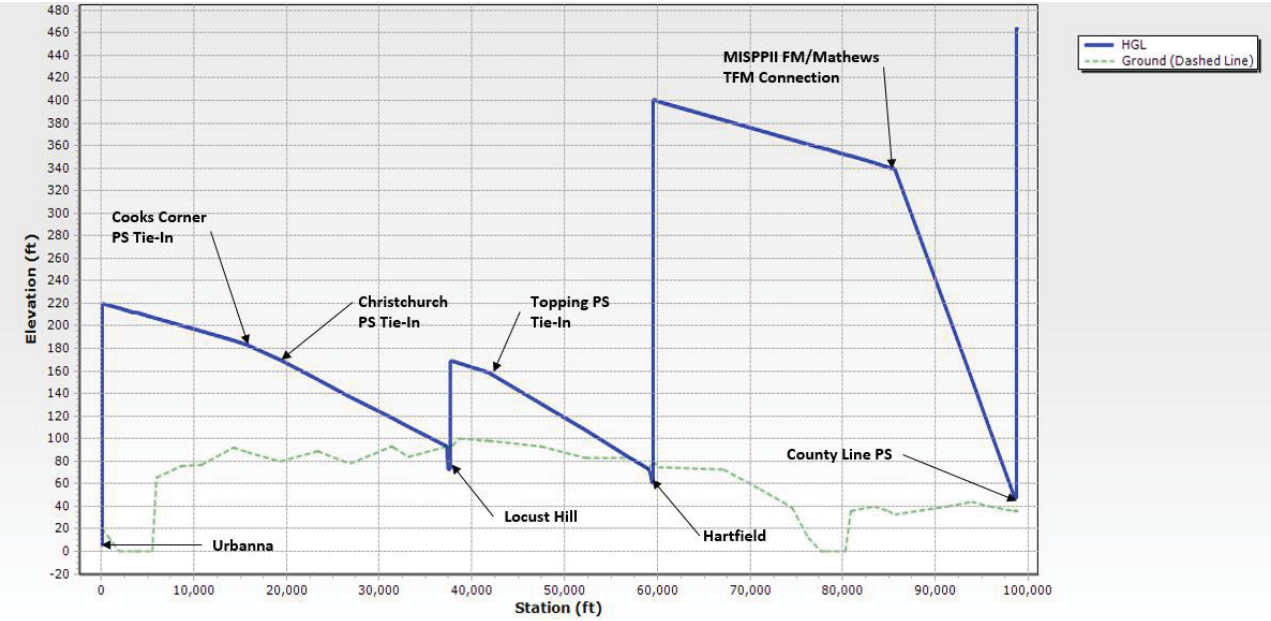


Figure 7-7: Pump Station Locations Alternative-3 Hydraulic Grade Line

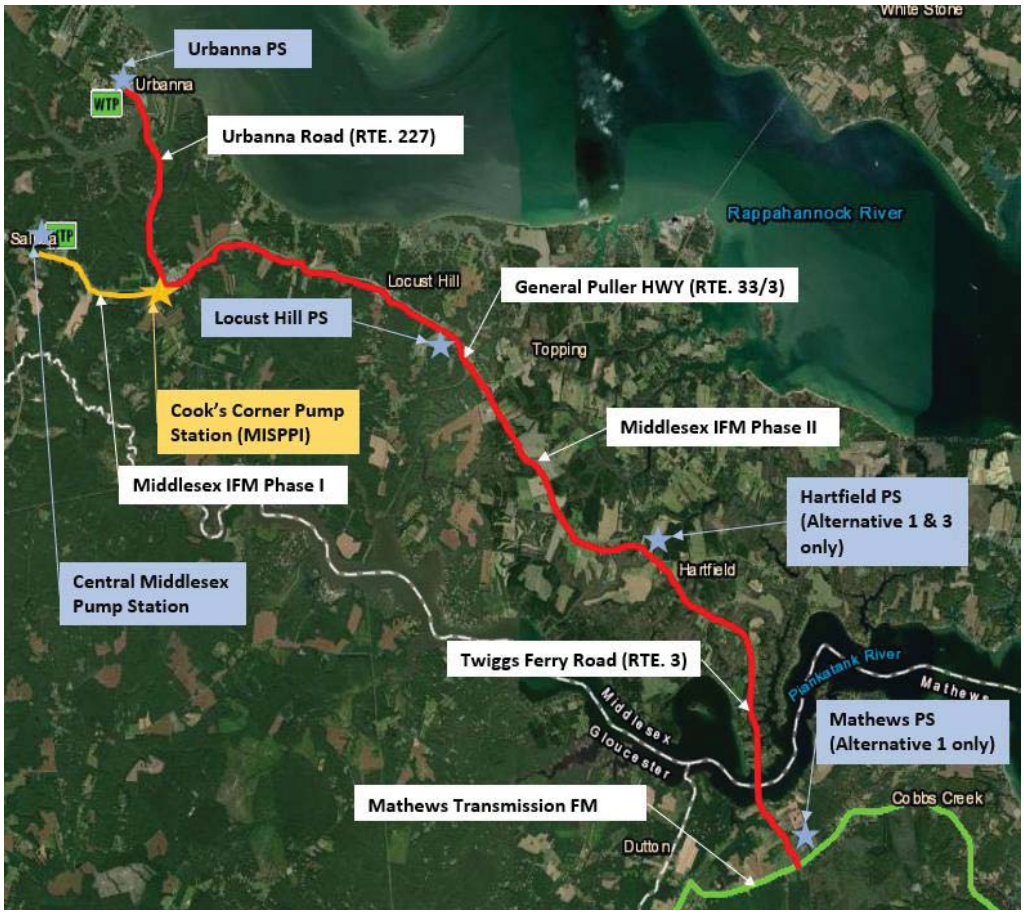
The first alternative results in a lower head conditions at the Hartfield pump, allows Buckley Hall to continue to discharge at 190 gpm without any improvements, and provides equalization at the interconnection of the two systems. However, this alternative includes an additional pump station within the Middlesex system compared to the other two alternatives. Based on discussion with HRSD it is desirable to limit the total number of pump stations within the system to reduce operation and maintenance requirements for HRSD.

The second alternative eliminates a station from the system compared to the first alternative and the hydraulics for this option were favorable to accommodate existing and 2030 projected flows within the corridor. However, this alternative would result in higher force main pressures during full build-out conditions which could potentially lock out the Topping and Deltaville service area pump stations connecting to the MISPPII force main between the Locust Hill and Hartfield. In order to avoid these issues in the future and provide more system flexibility, a pump station and hydraulic break at Hartfield is recommended. As a result, this alternative was not further evaluated.

The third alternative eliminates a pump station at the interconnection of the MISPPII force main and the Mathews force main. The hydraulic break at Hartfield in this alternative reduces the head at the Topping and Deltaville service area pump stations required to pump into the MISPPII system when compared to Middlesex Pump Stations Alternative 2. Middlesex Pump Stations Alternative 3 results in higher head conditions at the pump station in Hartfield and at Buckley Hall pump station in the Mathews system when compared to Middlesex Pump Stations Alternative 1. Without the hydraulic break at the interconnection of the two systems, the current pumps at Buckley Hall would discharge at approximately 131 gpm when the Hartfield pump station is operating and discharging at 300 gpm. Additionally, the higher head conditions at the Hartfield pump station likely eliminate the potential to install a submersible style station at Hartfield as pumps in series are anticipated to be required to meet the higher head

condition. Elimination of the pump station at the interconnection of the two systems also eliminates potential equalization storage at the interconnection. This will result in the need to either further increase system capacity in the Mathews system downstream of the County Line pump station and potentially add equalization storage within the Mathews system. Section 7.3.3 includes further discussion of alternatives to increase capacity within the Mathews system.

Potential sites for the pump stations along the MISPPII alignment were identified through coordination with Middlesex County. Section 8.2.4 includes further discussion of the pump station sites. Figure 7-8 shows the locations of proposed pump stations within the MISPPII force main corridor for Middlesex Pump Stations Alternatives 1 and 3. For simplicity the proposed pump stations names are presented in the figure and generally correlate to the service area they are located within, with the exception of the pump station located at the intersection of the MISPPII force main and the Mathews transmission force main identified in Middlesex Pump Stations Alternative 1 which is referred to as the Mathews pump station for the remainder of the report. The proposed pump station locations within the corridor are the Middlesex Pump Stations Alternatives 1 and 3 with the exception of the Mathews pump station, which is not included as part of Middlesex Pump Station Alternative 3.



*Note Central Middlesex PS discharges to the Cook's Corner PS which will discharge into the MISPPII force main

Figure 7-8: MISPPII Pump Stations Locations

7.3.3 Mathews System Improvements

As part of the preliminary engineering phase of the MISPPII, analysis of the Mathews transmission force main system was completed to identify capacity within existing system to convey the additional flows from the MISPPII service area. Alternatives to provide sufficient capacity within the Mathews system were developed and coordinated with HRSD.

Based on the analysis performed capacity within the Mathews system is not sufficient to accommodate anticipated flow rates in 2030 and beyond. Pump upgrades will be required at both the County Line pump station and the Beaver Dam pump station to convey projected 2030 average daily dry weather flows or wet weather flows. It should be noted based on conversations with HRSD, if a direct interconnection of the MISPPII force main to the Mathews force main is utilized, as presented in Middlesex Pump Stations Alternative 3, the resulting discharge rate of 131 gpm from the Buckley Hall pump station while the Hartfield pump station is operating is acceptable and no pump upgrades will be required at the Buckley Hall pump station to meet projected 2030 flows.

The capacity of the existing 6-inch DR-11 HDPE (DIPS/DR 11) force main downstream of County Line pump station is limited to approximately 290 gpm (C-factor of 125) to 305 gpm (C-factor of 130) without exceeding the pressure rating of the pipeline. As a result, the system cannot convey projected 2030 Middlesex and Mathews average daily flows or wet weather flows at a C-factor of 125 and at a C-factor of 130 has no additional capacity to convey flows above the projected 2030 Middlesex and Mathews average daily flows.

The existing 6-inch DR-11 HDPE (DIPS/DR 11) pipeline downstream of the static head structure has a maximum capacity calculated to be approximately 320 gpm. While this section of pipeline provides capacity to convey projected 2030 Middlesex and Mathews average daily flows, it only provides approximately 20 gallons per minute of excess capacity to convey flows exceeding the projected 2030 Middlesex and Mathews average daily flow rate. The limited additional capacity downstream of the static head structure allows for only minor increases in future flows beyond 2030 and will limit the ability to discharge flows stored during wet weather events extending the retention time of wet weather flows equalized upstream if the static head structure were to be utilized by HRSD in the future.

In order to reduce the required capacity in the Mathew system and necessary improvements to the Mathews system during wet weather events, it is anticipated equalization facilities will be installed in the MISPPII system. Both pump station location alternatives 1 and 3 are anticipated to require equalization in the MISPPII system, although volume and location of storage varies between the two alternatives. Further discussion of equalization requirements are included in section 7.3.4.

As a result of equalization storage in the MISPPII system, it is anticipated a constant flow rate of 300 gpm will be conveyed from the Middlesex system to the Mathews system during and following wet weather events when equalization is required to be utilized until the equalization facilities have fully drained. In order to convey the 300 gpm from the MISPPII system and projected 2030 average daily flow of 69 gpm from the Mathews system, the Mathews system capacity will need to be increased to a minimum of 370 gpm.

Increasing capacity in the Mathews system downstream of the interconnection of the MISPPII force main to 370 gpm would require equalization storage to be incorporated at the at the Mathews pump station in Middlesex Pump Stations Alternative 1 and at the County Line pump station in Middlesex Pump Stations Alternative 3 (further discussion of equalization requirements are included in section 7.3.4). Equalization will be required at either of these pump stations as the total incoming flow into either station when the Hartfield pump station is operating discharging approximately 300 gpm and the Buckley Hall pump station is operating (with no improvements) discharging approximately 131 gpm will be 431 gpm, exceeding the 370 gpm downstream capacity. Alternatively, additional equalization storage at Mathews pump station in Middlesex Pump Stations Alternative 1 and at the County Line pump station in Middlesex Pump Stations Alternative 3 can be avoided by increasing the capacity of the Mathews system downstream of the connection point of the MISPPII force main to 431 gpm, the maximum flow rate either pump station would receive when both Hartfield and Buckley Hall pump stations are operating.

Pump upgrades at the County Line pump station and the Beaver Dam pump station are necessary to accommodate an increase in the capacity in the Mathews system downstream of the interconnection of the MISPPII force main to either 370 gpm or 431 gpm. In order to eliminate areas of the system where the pressures exceed the pressure rating of the pipeline, two alternatives were considered to increase system capacity to either 370 gpm or 431 gpm. These alternatives included replacing over pressurized sections of force main with larger diameter pipe or pipe with a higher pressure rating or installation of an additional pump station between the County Line pump station and the Beaver Dam pump station. Table 7-7 summarizes the force main improvements necessary to increase capacity in the Mathews system to either 370 gpm or 431 gpm, as well as the anticipated pump station operating points for the County Line pump station and the new pump station located approximately halfway between the County Line pump station and the Beaver Dam pump station.

Table 7-7: Summary of Mathews System Improvements Required for Increased Downstream Capacity

Improvements for Mathews System Capacity 370 gpm Downstream of MISPPII Force Main Connection			
	Length (ft)	**Flow (gpm)**	**TDH (ft)**
Over Pressurized Pipeline Requiring Replacement	10,000	370	n/a
County Line PS	n/a	370	313
New PS Between County Line PS & Beaver Dam PS	n/a	370	315
Improvements for Mathews System Capacity 431 gpm Downstream of MISPPII Force Main Connection			
	Length (ft)	**Flow (gpm)**	**TDH (ft)**
Over Pressurized Pipeline Requiring Replacement	18,000	431	n/a
County Line PS	n/a	431	417
New PS Between County Line PS & Beaver Dam PS	n/a	431	419
*TDH at pump stations determined assuming C-Factor of 130 through existing Mathews Force main based on 2019 Telog data.			

As part of the preliminary engineering effort, alternatives for increased capacity were presented to HRSD. Based on discussion with HRSD installation of a new pump station between the County Line pump station and the Beaver Dam pump station is a more desirable alternative to increase capacity within the

Mathews System than the replacement of over pressurized force main between County Line and Beaver Dam pump stations.

An analysis of the equalization volume required within the MISPPII system and the Mathews system was completed to identify equalization volumes required if the Mathews system capacity was increased to 370 gpm and 431 gpm. Further discussion of equalization requirements are included in section 7.3.4.

7.3.4 Equalization Analysis

Hydraulic analysis completed of the existing Mathews transmission force main system indicates upgrades to the existing infrastructure in the Mathews transmission force main system will be required to convey projected average daily dry weather flows and wet weather flows from Middlesex County and Mathews County. Improvement alternatives to increase capacity in the Mathews transmission force main system are further discussed in section 7.3.3. To limit the improvement necessary Mathews system, it is anticipated equalization will be required in the MISPPII system to accommodate peak flows in excess of the average daily flow rates.

In order to evaluate the equalization requirements as part MISPPII it is was assumed improvements to the Mathews transmission force main system will increase capacity to either 370 gpm or 431 gpm. Increasing the capacity of the Mathews system downstream of the connection point of the MISPPII force main will provide additional pumping capacity above the projected 2030 flows from Middlesex County and Mathews County to accommodate wet weather flows and allow discharge of equalized flows. Analysis was completed to determine equalization requirements for each flow rate.

The following sections detail the methodology used to identify equalization volume required to accommodate peak hourly flows and excess wet weather flows during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event.

7.3.4.1 DAILY DIURNAL CURVE DEVELOPMENT

In order to identify equalization storage required in the MISPPII system, diurnal curves were established for Middlesex County and Mathews County. The 2019 Telog flow data for the Urbanna treatment plant in Urbanna and the Church Street pump station in Mathews County was processed to establish average flow rates for each hour of the day. The average flow rates for each hour at each site were then divided by the average daily flow rate at each site to develop unit diurnal curves. The average daily flow rate at the Urbanna treatment plant was approximately 32 gpm and at the Church Street pump station was approximately 38 gpm in 2019. Table 7-8 provides a summary of the average hourly flow rates and the unit flow for 2019 at the Urbanna treatment plant and at the Church Street pump station. Figure 7-9 shows the Urbanna treatment plant unit diurnal curve and Figure 7-10 shows the Church Street pump station unit diurnal curve.

Table 7-8: Urbanna TP & Church St. PS Avg. Hourly Flows and Unit Hourly Flows

Hour of Day	Urbanna TP		Church St. PS	
	Hourly Avg. Flow Rate (gpm)	Unit Flow Rate (Avg. Hourly Flow Rate/ ADF Rate)	Hourly Avg. Flow Rate (gpm)	Unit Flow Rate (Avg. Hourly Flow Rate/ADF Rate)
0	22.07	0.68	25.09	0.66
1	17.31	0.54	23.95	0.63
2	15.00	0.46	25.49	0.67
3	14.55	0.45	25.34	0.67
4	14.55	0.45	22.94	0.61
5	16.31	0.51	22.72	0.60
6	22.80	0.71	26.27	0.69
7	30.26	0.94	34.87	0.92
8	37.51	1.16	42.78	1.13
9	43.50	1.35	45.71	1.21
10	44.75	1.39	48.34	1.28
11	43.64	1.35	50.07	1.32
12	41.39	1.28	50.71	1.34
13	39.98	1.24	48.16	1.27
14	37.76	1.17	50.36	1.33
15	37.19	1.15	45.42	1.20
16	36.67	1.14	44.18	1.17
17	37.72	1.17	43.46	1.15
18	39.06	1.21	43.63	1.15
19	39.97	1.24	43.71	1.15
20	39.68	1.23	43.22	1.14
21	39.41	1.22	39.56	1.04
22	35.06	1.09	34.23	0.90
23	28.65	0.89	29.28	0.77

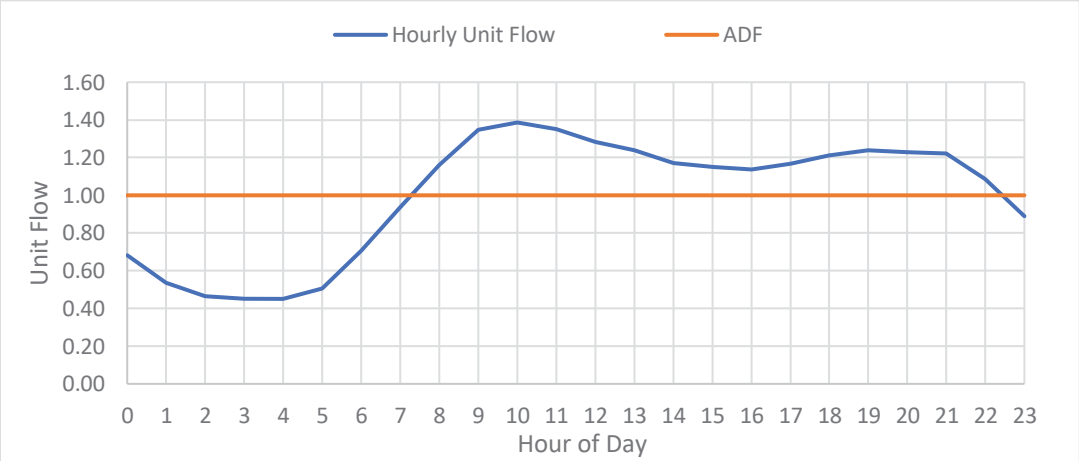


Figure 7-9: Urbanna Treatment Plant Unit Diurnal Curve

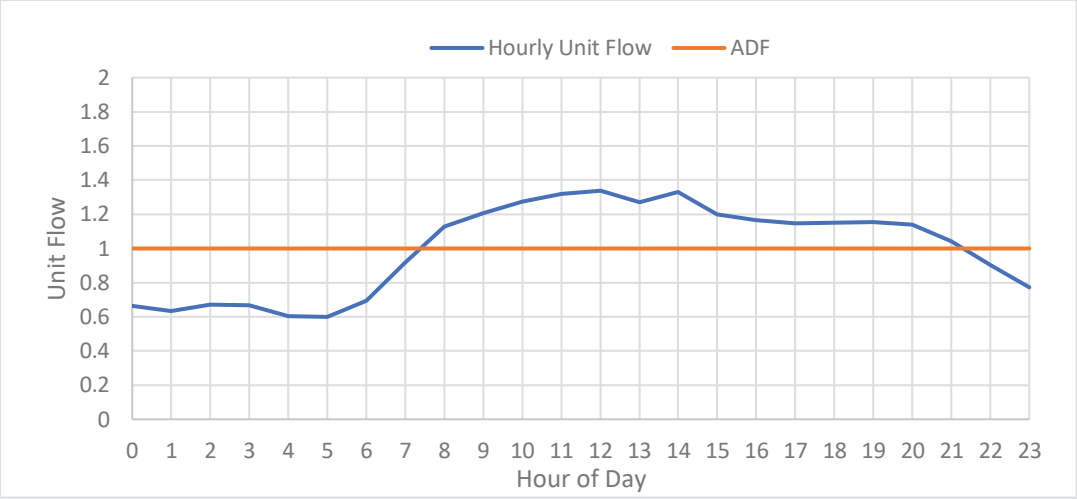


Figure 7-10: Church Street Pump Station Unit Diurnal Curve

7.3.4.2 DRY WEATHER FLOWS

Dry weather hourly flow rates were developed for each contributing service area by applying the unit diurnal curve to the projected 2030 average daily flow for each service area. For service areas within Middlesex County, the Urbanna treatment plant unit diurnal curve was applied, while the Church Street pump station unit diurnal curve was applied to flows from Mathews County. To establish dry weather hourly rates into each pump station flow from all service areas upstream of a pump station were applied at each pump station. Total flows into each pump station for every hourly interval were then calculated and summed to establish daily flow rates anticipated at each pump station. Figure 7-11 provides a schematic diagram representing how dry weather flow rates at each pump station were established.

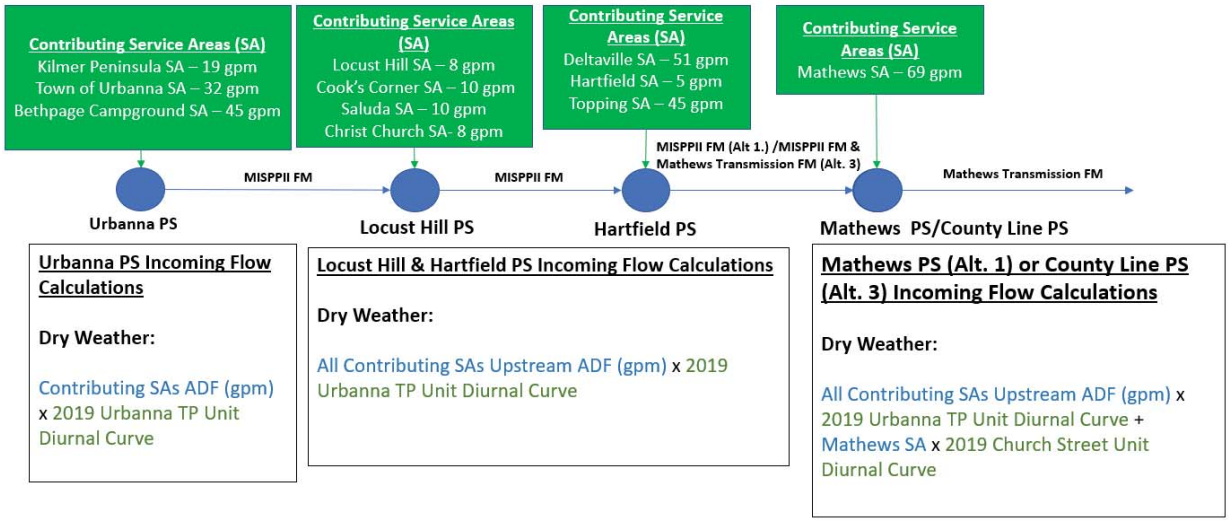


Figure 7-11: Dry Weather Flow Calculation Schematic

The projected 2030 average daily flow results in an average daily flow rate less than the anticipated pumping capacity of system. As a result, all average day dry weather flows over the course of a day will be conveyed downstream within a 24-hour period. It should be noted that dry weather equalization will be required at the Hartfield pump station. If the downstream capacity of the Mathews system is increased to 370 gpm dry weather storage will also be required at the Mathews pump station in pump station location Middlesex Pump Stations Alternative 1 and at County Line pump station in Middlesex Pump Stations Alternative 3 during periods when hourly flows exceed the pump rates out of the station; however, the stored flows will be conveyed downstream within a 24-hour period. Further discussion of equalization volumes at each pump station is included in section 7.3.4.4.

7.3.4.3 WET WEATHER FLOWS

Wet weather events generally increase flow within sanitary sewer systems as additional rainwater enters the system as a result of inflow during the event and higher ground water during and following wet weather events results in infiltration into sanitary sewer systems. Levels of inflow and infiltration entering sanitary sewer systems are highly variable and are dependent on a variety of factors including:

- System Type (i.e. Gravity Collection System, Low Pressure Grinder System, Vacuum System)
- System Condition
- Groundwater Conditions
- System Construction

In order to establish wet weather responses in gravity collection systems hydrologic models are generally developed utilizing existing flow data within sanitary sewer systems and system responses to wet weather events of varying intensity and duration. The responses of the system are modeled to establish response factors (commonly RTK factors) for a particular sewer catchment area. RTK factors calibrated in the hydrologic model are then input into a hydraulic model. A desired design storm event can then be applied in the hydraulic model to identify the system rainfall response.

Hydrologic modeling efforts were not included as part of the preliminary engineering efforts for MISPPII. In order to establish wet weather peaking factors for flows from the service areas conveying flow into the MISPPII system and the Mathews systems flow responses to wet weather events at the Urbanna treatment plant and the Church Street pump station were reviewed. HRSD indicated the design storm generally utilized in the Regional Hydraulic Model is a 5-year recurrence interval event with a 4-hour duration. Two rainfall events were identified using Telog data at the Urbanna treatment plant rain gage exceeding the 5-year recurrence interval event rainfall totals for a particular event duration. The two wet weather events are included in Table 7-9.

The flow responses to the two 5-year recurrence interval events were reviewed for a 24-hour period from when the wet weather event began. Peak hourly flow rates and total 24-hour flow were identified at the Urbanna treatment plant and the Church Street pump station. The maximum hourly peaking factors were established by dividing peak hourly flow rate by the average daily flow (ADF) rate at each site and total 24-hour flow peak factor was established by dividing the total flow over the 24-hour period when the wet weather event began by the ADF at each site. The average daily flow at the Urbanna treatment plant was approximately 46,483 gpd and at the Church Street pump station was approximately

54,576 gpd in 2019. Table 7-9 provides a summary of the peak hourly and 24-hour flows during the wet weather events.

Table 7-9: 5-Year Recurrence Interval Wet Weather Event Flow Responses

Wet Weather Event Date	Rain (in)	Recurrence Interval & Duration	Urbanna Treatment Plant				Church Street Pump Station			
			Peak Hourly Flow Rate (gpm)	24-hour Flow (gallons)	Max Hourly Peak Factor	Wet Weather 24-hr Flow Peak Factor	Peak Hourly Flow Rate (gpm)	24-hour Flow (gallons)	Max Hourly Peak Factor	Wet Weather 24-hr Flow Peak Factor
10/20/2019 8 AM to 2 PM	3.45	5 yr 6 Hr	102	101030	3.16	2.17	107	70292	2.82	1.29
8/ 3-4/2020 10 PM to 10 AM	4.17	5 yr 12 Hr	91	112,034	2.82	2.41	112	65,408	2.95	1.20

To establish hourly and 24-hour wet weather flows a wet weather adjustment factor was applied to the unit diurnal curve established for Middlesex County service areas and Mathews County service areas. A wet weather adjustment factor of 2.5 was applied for service areas with existing collection systems within Middlesex County and a wet weather adjustment factor of 2.0 was applied to the Mathews County service area based on the wet weather 24-hour flow peak factors identified during the 5-year recurrence interval events. A wet weather adjustment factor of 2.0 was applied to all service areas where new sewer systems will be constructed. Generally, inflow and infiltration in newer systems, if constructed properly, is lower than in older collection systems; however, as previously noted inflow and infiltration into sanitary sewer systems is highly variable and dependent on a variety of factors. Figure 7-12 provides the diurnal curve adjusted for wet weather events applied to Middlesex County services areas and Figure 7-13 provides the diurnal curve adjusted for wet weather events applied to the Mathews County service area.

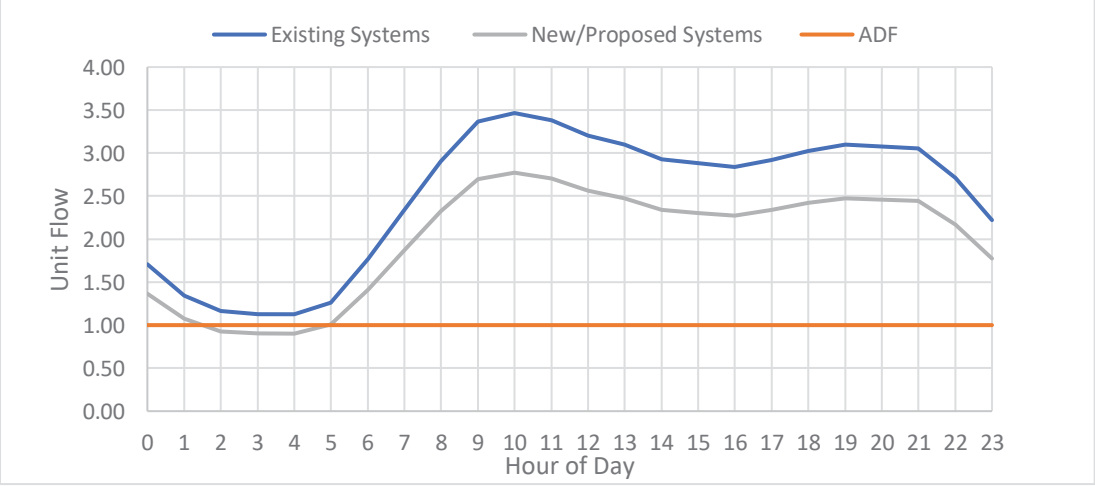


Figure 7-12: Middlesex County Service Areas Unit Diurnal Curves with Wet Weather Adjustment Factor Applied

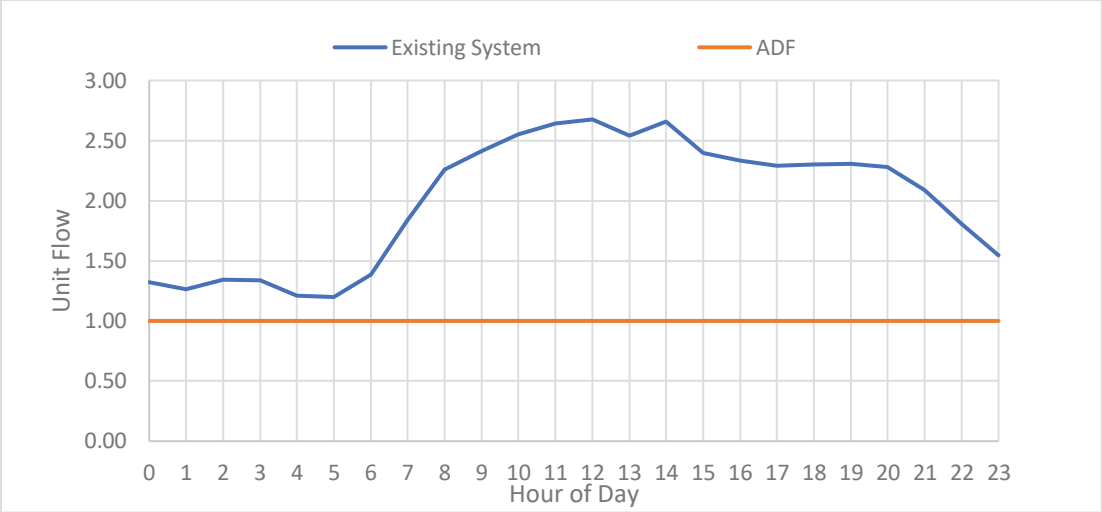


Figure 7-13: Middlesex County Service Areas Unit Diurnal Curves with Wet Weather Adjustment Factor Applied

To establish wet weather hourly flow rates into each pump station along the MISPPII force main the 2030 projected average daily flow rates identified for each service area conveying flow directly into the pump station and each service area connecting to the MISPPII force main between the pump station and the next upstream pump station were multiplied by the appropriate diurnal curve and wet weather adjustment factor and summed. The sum of the contributing service flows was then added to the wet weather average daily flow rate from the next upstream pump station along the MISPPII force main. The wet weather average daily flow rate was established by subtracting the equalization volume provided from the total volume of wet weather flow entering a pump station during a 24-hour period. Figure 7-14 provides a schematic diagram representing how wet weather flow rates at each pump station were established.

Utilizing this methodology total wet weather flows from Middlesex County during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event are anticipated to be approximately 733,000 gallons and total wet weather flows from Mathews County during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event are anticipated to be approximately 200,000 gallons.

At a flow rate of 300 gpm through the MISPPII system the daily pumping capacity is 432,000 gallons, resulting in approximately 300,000 gallons of equalization storage being required for flows from the Middlesex service areas during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event.

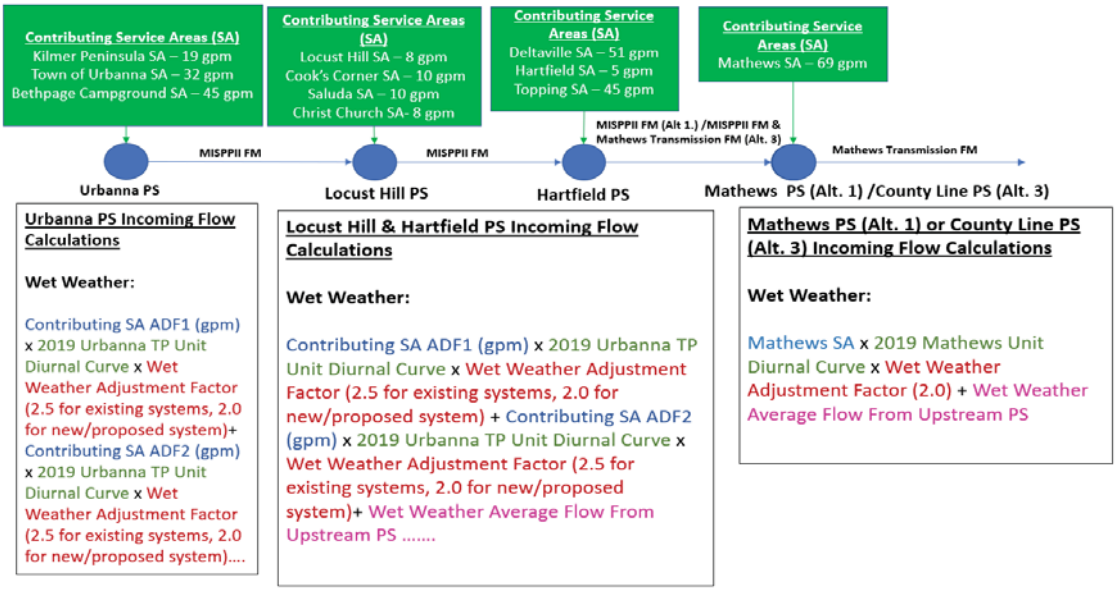


Figure 7-14: Wet Weather Flow Calculation Schematic

Upgrades in the Mathews system are anticipated to provide a pumping capacity of either 370 gpm or 431 gpm, resulting in a daily pumping capacity of either 532,800 gallons or 620,640 gallons respectively. Assuming the flow pumped from the Middlesex system during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event is equal to the daily pumping capacity of 432,000 gallons, approximately 632,000 gallons of flow would enter the Mathews system during a 24-hour period following the beginning of a 5-year recurrence interval wet weather event. If the Mathews system capacity downstream of the connection of the MISPPII force main is increased to 370 gpm, approximately 100,000 gallons of additional equalization storage will be necessary to accommodate flows from the Middlesex system and the Mathews service areas during a 24-hour period following the beginning of a 5-year recurrence interval wet weather event. While approximately 12,000 gallons of additional equalization storage will be necessary to accommodate flows from the Middlesex system and the Mathews service areas during a 24-hour period following the beginning of a 5-year recurrence interval wet weather event if the downstream capacity of the Mathews system is increased to 431 gpm. It should be noted these anticipated storage quantities are based on a total anticipated flow during a 24-hour period following the beginning of a 5-year recurrence interval wet weather event and the daily pumping capacity of the MISPPII system and the Mathews system. Additional storage maybe required to accommodate peak hourly flows in excess of the pumping capacity of pump stations within these systems and to accommodate flows in the days following the rainfall event as equalization basins are being drained.

Further discussion of equalization volumes required at each pump station for the two Middlesex Pump Station Alternatives considered and the two downstream capacities evaluated in the Mathews system is included in section 7.3.4.4.

7.3.4.4 EQUALIZATION REQUIREMENTS

In order to accommodate projected 2030 flows in MISPPII system equalization will be required based on the projected peak dry weather hourly flows and the anticipated flows during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event. Downstream capacity in the Mathews transmission force main will ultimately dictate the total volume of equalization storage required.

Equalization is required when flow rates entering a pump station exceed the discharge pump rate of the station. Analysis was performed to identify the volume of dry weather storage required at proposed pump stations along the MISPPII force main during average day diurnal dry weather flows. The volume of equalization required was calculated by identifying hours in which the anticipated flow rate into a pump station exceeded the pump discharge rate and multiplying the difference between the projected inflow rate and the discharge pump rate by the duration of time the flow rate exceeds the pump rate. Table 7-10 includes the maximum and minimum dry weather flows anticipated at each station, the average daily dry weather flow at each station and the average dry weather flow rate out of each station in Middlesex Pump Stations Alternative 1.

Table 7-10: Middlesex Pump Stations Alternative 1 Dry Weather Flows, Dry Weather Equalization & Pumping Capacity

	Urbanna PS	Locust Hill PS	Hartfield PS	Mathews PS*	Mathews PS**
Dry Weather Max Hourly Inflow (gpm)	133	183	323	411	411
Dry Weather Min. Hourly Inflow (gpm)	43	59	105	147	147
Daily Dry Weather Flow (gal)	137,650	189,622	335,902	435,248	435,248
Daily Dry Weather Storage Required (gal)	-	-	3,176	7,996	-
Design Pump Discharge Rate (gpm)	300	300	300	370	431
Design Pumping Capacity (gpd)	432,000	432,000	432,000	532,800	620,640

*Mathews system downstream capacity increased to 370 gpm
** Mathews system downstream capacity increased to 431 gpm

Based on this analysis dry weather equalization will be required at the Hartfield pump station regardless of the downstream capacity improvements in the Mathews system and at the Mathews pump station if downstream improvements only provide capacity up to 370 gpm in the Mathews system. However, flows stored during average dry weather flow will be conveyed downstream within a 24-hour period as the daily pumping capacity of these stations exceeds the ADF into the station.

Table 7-11 includes the maximum and minimum dry weather flows anticipated at each station, the average daily dry weather flow at each station and the average dry weather flow rate out of each station Middlesex Pump Stations Alternative 3. Based on this analysis dry weather equalization will be required

at the Hartfield pump station regardless of the downstream capacity improvements in the Mathews system and at the County Line pump station if downstream improvements only provide capacity up to 370 gpm in the Mathews system. However, flows stored during average dry weather flow will be conveyed downstream within a 24-hour period as the daily pumping capacity of these stations exceeds the ADF into the station.

Table 7-11: Middlesex Pump Stations Alternative 3 Dry Weather Flows, Dry Weather Equalization & Pumping Capacity

	Urbanna PS	Locust Hill PS	Hartfield PS	County Line PS*	Buckley Hall PS*	County Line PS**	Buckley Hall PS**
Dry Weather Max Hourly Inflow (gpm)	133	183	323	411	92	411	92
Dry Weather Min. Hourly Inflow (gpm)	43	59	105	147	41	147	41
Daily Dry Weather Flow (gal)	137,650	189,622	335,902	435,248	99,346	435,248	99,346
Daily Dry Weather Storage Required (gal)	-	-	3,176	7,996	-	-	-
Design Pump Discharge Rate (gpm)	300	300	300	370	131*** 190****	431	131*** 190****
Design Pumping Capacity (gpd)	432,000	432,000	432,000	532,800	188,640*** 273,600****	620,640	188,640*** 273,600****

*Mathews system downstream capacity increased to 370 gpm
** Mathews system downstream capacity increased to 431 gpm
***Buckley Hall discharge rate/pumping capacity when Hartfield PS is operating
****Buckley Hall discharge rate/pumping capacity when Hartfield PS is not operating

Analysis was performed to identify the equalization volume required at each pump station to accommodate wet weather flows during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event. The analysis identified if equalization was required at the pump station site due to peak hourly flow rates exceeding the pump discharge capacity of the station. The total equalization requirement shown at each site in the Table 7-12 and Table 7-13 was calculated by multiplying the hourly flow rates in excess of the pumping capacity by sixty (60) minutes and summing the total volume during the single 24-hour period following the beginning of a 5-year recurrence interval wet weather event.

The analysis was performed for both Middlesex Pump Stations Alternative 1 and Middlesex Pump Stations Alternative 3, and was completed for increases in the downstream Mathew system capacity of both 370 gpm and 431 gpm. Table 7-12 provides the results of the analysis for Middlesex Pump Stations Alternative 1 and Table 7-13 provides the results of the analysis for Middlesex Pump Stations Alternative 3.

Table 7-12: Middlesex Pump Stations Alternative 1 Wet Weather Flows, Wet Weather Equalization & Pumping Capacity

		Urbanna PS	Locust Hill PS	Hartfield PS	Mathews PS*	Mathews PS**
Wet Weather	**Wet Weather Max Hrly Inflow (gpm)**	318	335	573	485	485
	Wet Weather Min. Hrly Inflow (gpm)	103	263	383	383	383
	Daily Wet Weather Flow (gal)	330,400	439,088	711,600	630,692	630,692
Design Pump Capacity	**Design Pump Discharge Rate (gpm)**	300	300	300	370	431
	Design Daily Pumping Capacity (gal)	432,000	432,000	432,000	532,800	620,640
Equalization Requirements	**Daily Wet Weather Equalization Volume Required (gal)**	2,240	20,048	279,600	97,892	29,627

*Mathews system capacity downstream capacity increased to 370 gpm
** Mathews system capacity downstream capacity increased to 431 gpm
***Note: Daily wet weather flow to Mathews PS is limited by pumping capacity of Hartfield PS

The analysis indicates in Middlesex Pump Stations Alternative 1 equalization is required due to anticipated peak wet weather hourly flow rates at the Urbanna pump station, the Locust Hill pump station, the Hartfield pump station and the Mathews pump station regardless of whether the downstream capacity in the Mathews system is increased to 370 gpm or 431 gpm. It also indicates equalization is required at the Locust Hill pump station, the Hartfield pump station and the Mathews Pump station as a result of the anticipated wet weather flows during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event exceeding the daily pumping capacity of the pump stations. It should be noted the equalization requirements due to peak wet weather hourly flow rates exceeding the pumping capacity at the Urbanna pump station are minimal, and it is anticipated excess flows can be stored within the wet well and will be discharged within the 24-hour period following the beginning of a 5-year recurrence interval wet weather event.

The analysis indicates in Middlesex Pump Stations Alternative 3 equalization requirements at the Urbanna pump station, Locust Hill pump station, and Hartfield pump station are equal to the requirements in Middlesex Pump Stations Alternative 1. Based on the analysis performed if the improvements in the Mathews system downstream of the interconnection of the MISPPII force main result in capacity of the Mathews system to increase to 370 gpm, approximately 70,000 gallons of equalization storage will be required at the County Line pump station and approximately 30,000 gallons of equalization storage will be required at the Buckley Hall pump station. If the improvements in the Mathews system downstream of the interconnection of the MISPPII force main result in capacity of the Mathews system to increase to 431 gpm no equalization storage will be required at the County Line pump station and approximately 30,000 gallons of equalization storage will be required at the Buckley Hall pump station. Based on record drawings of the County Line and Buckley Hall pump stations provided

by HRSD, the existing above ground wet wells at each station provide approximately 7,500 gallons and 45,000 gallons of storage respectively.

Table 7-13: Middlesex Pump Stations Alternative 3 Wet Weather Flows, Wet Weather Equalization & Pumping Capacity

		Urbanna PS	Locust Hill PS	Hartfield PS	County Line PS*	Buckley Hall PS*	County Line PS**	Buckley Hall PS**
Wet Weather	**Wet Weather Max Hrly Inflow (gpm)**	318	335	573	431	185	431	185
	Wet Weather Min. Hrly Inflow (gpm)	103	263	383	383	83	383	83
	Daily Wet Weather Flow (gal)	330,400	439,088	711,600	601,065	198,692	601,065	198,692
Design Pump Capacity	**Design Pump Discharge Rate (gpm)**	300	300	300	370	131***	431	131***
	Design Daily Pumping Capacity (gal)	432,000	432,000	432,000	532,800	188,640***	620,640	188,640***
Equalization Requirements	**Daily Wet Weather Equalization Volume Required (gal)**	2,240	20,048	279,600	68,265	29,627	0	29,627

*Mathews system downstream capacity increased to 370 gpm
** Mathews system downstream capacity increased to 431 gpm
***Buckley Hall discharge rate/pumping capacity when Hartfield PS is operating. Hartfield PS is anticipated to be operating throughout 24-hour period following the beginning of a 5-year recurrence interval wet weather event

Based on the equalization analysis a minimum of approximately 400,000 gallons of equalization storage will be required to accommodate wet weather flows for a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event in both Middlesex Pump Station Alternative 1 and 3 if the downstream capacity is increased to 370 gpm. If downstream capacity in the Mathews system is increased to 431 gpm, approximately 332,000 gallons of equalization storage will be required to accommodate wet weather flows for a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event in both Middlesex Pump Station Alternative 1 and 3. It should be noted the analysis described in this section only accounts for the storage necessary to accommodate wet weather flows during a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event and additional storage may be required to accommodate flows in the days following the rainfall event as equalization basins are being drained. Section 7.3.6 further details utilizing an extended period simulation model to account for additional storage required to accommodate flows in days following the rainfall event.

7.3.4.5 EQUALIZATION STORAGE SITING

The equalization analysis performed in section 7.3.4.4 indicates equalization facilities will be required at all of the proposed pump stations along the MISPPII force main with the exception of the Urbanna pump station in both Middlesex Pump Stations Alternative 1 and 3. It is anticipated the Urbanna pump station wet well will provide sufficient storage capacity to store excess wet weather flows. The proposed pump station sites along the MISPPII force main, except for the proposed Urbanna Pump station, are located outside of residential areas decreasing the likelihood of any odors resulting from stored flows to affect residents. It is anticipated sufficient property could be acquired at both the Locust Hill and Hartfield sites, as well as the Mathews pump station site if Middlesex Pump Station Alternative 1 is selected, to locate equalization facilities at the pump stations. It is anticipated equalization facilities at these sites will be buried HDPE tanks to allow excess flows to enter and exit the storage tanks via gravity flow.

For the Urbanna pump station location options, on-site equalization storage would only be considered if Alternative 5 (detailed in section 8.2.3) is selected. This alternative locates a new pump station on the vacant parcel immediately adjacent to HRSD's existing Urbanna treatment plant. Equalization facilities could either be constructed adjacent to the new pump station or on the existing treatment plant site. If the existing treatment plant site is used, equalized flows would need to be pumped up to the site because of the difference in elevation. For the alternative that locates the new Urbanna pump station adjacent to or on Tabor Park property where there is limited space, equalization could be achieved by pumping equalized flows to an "off-site" facility constructed at the existing treatment plant site. This would require dedicated tank fill/drain lines between the treatment plant storage facility and the new pump station at Tabor Park.

While viable alternatives are present to place equalization facilities in Urbanna, adding additional downstream storage capacity at the Locust Hill and Hartfield stations, as well as the Mathews station if Middlesex Pump Stations Alternative 1 is selected, can be accommodated at locations outside of residential areas where any odors are less likely to impact residents. As a result, locating an equalization facility in Urbanna was not considered further.

No additional storage is necessary at existing pump stations within the Mathews system if Middlesex Pump Station Alternative 1 is selected. If Middlesex Pump Station Alternative 3 is selected additional equalization storage will be needed at the County Line pump station if downstream capacity in the Mathews system is increased to 370 gpm. No additional storage is required at the County Line pump station if the downstream capacity in the Mathews system is increased to 431 gpm. It is anticipated sufficient storage is present within the above ground wet wells at the Buckley Hall pump station to accommodate wet weather flows, so it is anticipated no additional storage will be required at that station regardless of whether the downstream capacity of the Mathews system is increased to 370 gpm or 431 gpm.

If Middlesex Pump Station Alternative 3 is selected and downstream capacity in the Mathews system is increased to 370 gpm installation of additional equalization will be required at the County Line pump station. Without reconfiguration of the County Line pump station either above ground steel tanks providing equalization storage or buried HDPE equalization storage tanks with a pumping system to discharge stored flows back into the above ground wet wells would be required.

7.3.5 Recommended Mathews System Improvements and MISPPII Pump Stations

An increase in capacity within the Mathews system downstream of the interconnection of the MISPPII force main will be required to convey flows from both the Middlesex and Mathews service areas. Based on conversations with HRSD installation of a new pump station is preferred over replacement of the existing force main to increase the system capacity. Similar improvements are required to increase the system's capacity to either 370 gpm or 431 gpm; however, increasing the system capacity to 431 gpm reduces the equalization storage volume required to accommodate wet weather flows during the 24-hour period following the beginning of a 5-year recurrence interval wet weather event in both Middlesex Pump Stations Alternative 1 and 3. An increased system capacity of 431 gpm in the Mathews system downstream of the connection of the MISPPII force main eliminates the need for the approximately 62,500 gallons of additional equalization storage to be constructed at the County Line pump station. As a result, it is recommended to increase the Mathews system capacity downstream of the interconnection of the MISPPII force main to 431 gpm rather than 370 gpm.

Both Middlesex Pump Stations Alternative 1 and 3 provide viable alternatives to accommodate flows from the Middlesex and Mathews service areas. Middlesex Pump Stations Alternative 1 provides a hydraulic break at the connection of the two systems, leading to lower head conditions at both the existing Buckley Hall pump station and the proposed Hartfield pump station. It also allows the Buckley Hall Pump station to continue to operate at 190 gpm without any pump improvements, maintaining scouring velocity within the existing force main between Buckley Hall and the Mathews pump station. As a result of the lower head conditions at the Hartfield pump station in Middlesex Pump Stations Alternative 1, it is anticipated smaller duplex submersible type pump station or suction lift station would be a viable option at the Hartfield pump station. Resulting in a smaller pump station footprint and less expensive pump station when compared to a dry pit submersible type station with pumps in series or suction lift stations with multiple pump stages required to accommodate the higher head conditions at the Hartfield pump station in Middlesex Pump Stations Alternative 3.

Middlesex Pump Station Alternative 3 eliminates the need for an additional pump station at the interconnection of the MISPPII force main and the Mathews force main. Reducing the overall number of pump stations within the Middlesex and Mathews systems HRSD has to maintain. Despite the higher head conditions at the Buckley Hall pump station it is anticipated no improvements will be required to the existing pumps as the reduced pumping is sufficient to accommodate interim (2030) dry weather flows, and sufficient storage is already available at the Buckley hall pump station to accommodate wet weather flows above the reduced pumping capacity of the station while the Hartfield pump station is operating. Although this alternative will result in velocities below 2 fps within the existing force main between Buckley Hall pump station and County Line pump station while both the Hartfield and Buckley Hall pump stations are operating, when Hartfield pump station is not operating the Buckley Hall pumps will continue to discharge at 190 gpm exceeding the minimum scouring velocity in the force main.

In order to convey full-buildout flows various upgrades will be required in both the Middlesex and Mathews systems. These upgrades are anticipated to include pump upgrades and potentially adding additional equalization at pump stations; however, due to the pressure limitations of the existing pipeline downstream of the Buckley Hall pump station, it is anticipated either replacement of over pressurized pipe downstream the Buckley Hall pump station or installation of a pump station at the connection of

the MISPPII force main and the Mathews force main will be required to convey full build out flows (2040 flows). It should be noted pressure limitations may be present under full build-out flow conditions in the pipeline downstream of the Hartfield pump station if Middlesex Pump Stations Alternative 3 is selected and a hydraulic break is not provided at the interconnection of the MISPPII force main and the Mathews force main. The final pressure rating of the force main downstream of the Hartfield pump station will be determined during the design phase.

Due to the uncertain quantity and timing of full-build out flows, the ability to meet interim (2030) flows with one less pump station, and the potential to resolve over pressurized section of force main downstream of the Hartfield and Buckley hall pump stations in the future with the installation of a pump station with a hydraulic break at the intersection of the MISPPII force main and the Mathews force main Middlesex Pump Station Alternative 3 is recommended to meet the interim (2030) flow conditions.

7.3.6 Extended Period Simulation Model – Equalization Verification

The equalization analysis provided in section 7.3.4 indicated the storage required at each pump station site to accommodate wet weather flows for a single 24-hour period following the beginning of a 5-year recurrence interval wet weather event. The analysis was not intended to account for any additional storage capacity required for flows during the days following a 5-year recurrence interval wet weather event as equalization basins are drained. In order to analyze additional storage required during the days following a wet weather event, an extended period simulation (EPS) hydraulic model was developed using Bentley's SewerCad Connect edition.

Sanitary sewer flow loading was incorporated into the EPS model for dry weather and wet weather utilizing the same concepts presented in section 7.3.4. Similar to the steady state hydraulic model a C-factor of 150 was used for new HDPE piping and a C-Factor of 130 was used for existing HDPE piping.

The EPS model incorporated pump stations in accordance with Middlesex Pump Station Alternative 3, as well as the addition of a pump station between the County Line pump station and the Beaver Dam pump station. The EPS model was created assuming capacity improvements in the Mathews system will be made to accommodate a flow rate of 431 gpm. Discharge flow rates from the County Line pump station, the pump station between the County Line pump station and the Beaver Dam pump station, and the Beaver Dam pump station were set to 431 gpm in the EPS model. The existing pump curve at the Buckley Hall pump station was incorporated into the model. Based on the pump curve the Buckley Hall pump station discharges at 190 gpm when the Hartfield pump station is not operating and 131 gpm while the Hartfield pump station is operating. The discharge rates at the Urbanna pump station, Locust Hill pump station, and Hartfield pump station along the MISPPII force main were set to 300 gpm in the EPS model.

Existing above ground wet wells present at the Buckley Hall and County Line pump stations within the Mathews system, approximately 45,000 gallons and 7,500 gallons respectively, were incorporated into the EPS model. In the initial model simulation, the equalization storage quantities identified in Table 7-13 to be required at the Locust Hill pump station and the Hartfield pump station were included at each of the pump stations.

It should be noted the equalization volumes at each pump station in the EPS model include the pump station wet well at each of the sites. Based on the proposed pump station configurations and wet well

sizes at the Locust Hill and Hartfield pump stations presented in section 8.2 and an invert depth of 15 feet for the gravity sewer line entering each of the pump station wet wells, it is anticipated approximately 8,500 gallons of wet well storage will be available in the Locust Hill wet well and approximately 25,000 gallons of wet well storage will be available in the Hartfield wet well prior to surcharging the gravity sewer systems each pump station collects flows from. Additional equalization capacity is anticipated to be present in the Locust Hill and Hartfield pump station gravity sewer collection systems; however, this additional capacity was not reviewed as part of this analysis.

The EPS model was run for a total of 10 days, with the 5-yr wet weather event beginning at hour 48 of the analysis. Various iterations of adjusting the volume of equalization at each site were completed to identify the required volume of equalization storage at the Locust Hill pump station site and the Hartfield pump station site. Table 7-14 summarizes the total storage volume provided at each pump station site (includes both equalization storage basins and wet well storage), the maximum volume of storage used during the EPS and the excess storage capacity remaining.

Table 7-14: EPS Model Equalization Volumes

	Locust Hill PS	Hartfield PS	Buckley Hall PS	County Line PS
Total Storage (gallons)	108,500	300,000	45,000	7,500
Wet Well Storage (gallons)	8,500	25,000	45,000	7,500
EQ Basin Storage (gallons)	100,000	275,000	0	0
Total Storage Used During ESP (gallons)	71502	275100	37170	4358
Total Excess Storage Available (gallons)	36,998	24,900	7,830	3,142

Figure 7-15 provides the volume of flow equalized at each pump station throughout the 10 day EPS model, as well as the duration to drain the equalized flows. The EPS indicates the Locust Hill, Buckley Hall and County line stations discharge equalized flows within the first 24-hours following the end of the 24-hour period with 5-yr wet weather event flows, while equalized flows at the Hartfield pump station take approximately 3 days following the end of the rainfall event to drain.

Based on the EPS model analysis, no additional equalization storage is recommended at the existing Buckley Hall pump station or County Line pump station in the Mathews system. Equalization storage volume of 100,000 gallons, in addition to the 8,500 gallons anticipated to be provided in the Locust Hill pump station wet well, is recommended at the Locust Hill pump station. Equalization storage volume of 275,000 gallons, in addition to the 25,000 gallons anticipated to be provided in the Hartfield pump station wet well, is recommended at the Hartfield pump station. It should be noted full build out flows from the Middlesex County and Mathews County service areas will ultimately dictate the equalization volumes required at each site; however, the below grade HDPE equalization systems proposed at the Locust Hill pump station and the Hartfield pump stations can be constructed in phases or expanded depending the quantity and timing of future flows.

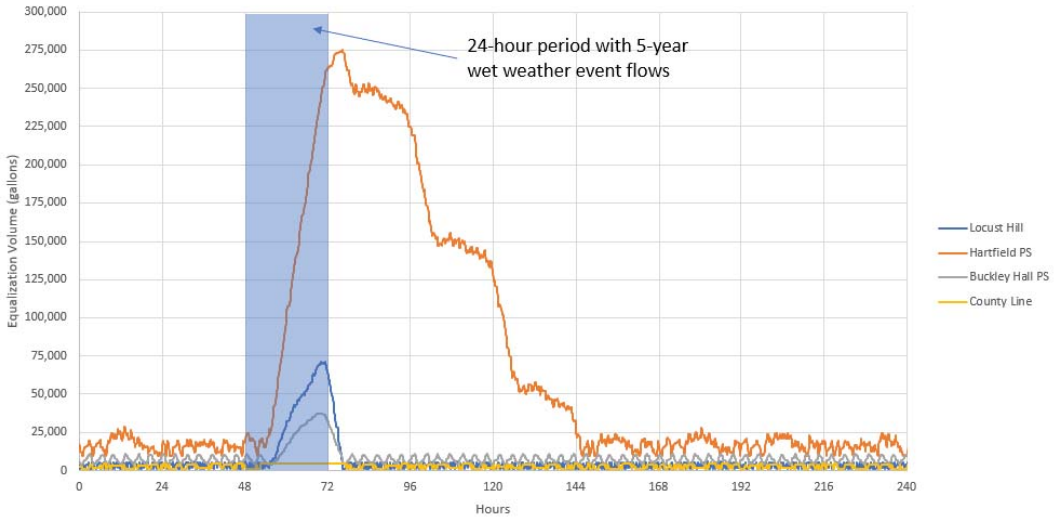


Figure 7-15: EPS Model Equalization Storage Volume

8 Existing Pump Station Upgrades, Preliminary Pump Station Configurations & Existing Treatment Plant Decommissioning

8.1 Pump Station Style

Various pump station styles were considered for the proposed pump stations to be installed as part of MISPPII. Two general pump station types were considered, wet well pump stations with flows being discharged to a wet well subject to atmospheric pressure and in-line or PRS style stations. Along the MISPPII force main in areas where future gravity or low pressure force main collection systems maybe located, it was determining only wet well type pump stations allowing the collection systems to discharge into the wet well would be considered. The style stations considered included submersible pump stations, dry pit submersible pump stations, and suction lift pump stations. It should be noted, a PRS style station maybe viable for the new pump station within the Mathews system between the County Line pump station and the Beaver Dam pump station.

8.1.1 Submersible Pump Stations

Submersible pump stations generally consist of a below grade wet well with a submersible pump located within the wet well. These stations generally collect flow from local gravity sewer collection systems or low pressure force main systems in the wet well. Collected flows are discharged by submersible pumps located in the wet well through a force main extending up through the wet well and penetrating the wet well below grade. Generally, these pump stations include a separate valve vault just outside of the wet well where the isolation and check valves are housed. Pumps at these stations can be constant speed or VFD controlled. Small electrical buildings are generally provided for submersible stations with VFDs. Access to the pumps for maintenance is generally provided through a slide rail system.

8.1.2 Dry Pit Submersible Pump Stations

Dry pit submersible pump stations are similar to submersible stations as they generally have a below grade wet well collecting flows from local gravity and low pressure force main systems. The primary difference is the pumps are house in a separate pump room located adjacent to the wet well below grade. The finished floor elevation of the pump room is generally equal to the bottom of the wet well. Suction lines extend through wall penetrations into the wet well and discharge piping and valving is generally located in the pump room. Pumps at these stations can be constant speed or VFD controlled. An electric room is generally located over the pump room with access to the below grade pump room through the electric room. Dry pit submersible pump stations offer the opportunity to provide pumps in series as the pumps and piping connecting the pumps are directly accessible in the pump room.

8.1.3 Suction Lift Pump Stations

Suction lift pump stations are similar to submersible stations with the exception of the pumps being located at grade rather than within the wet well. Suction lines extend from the pumps down into the wet well. Smaller vacuum pumps are used to prime the discharge pumps in suction lift stations. Pumps at these stations can be constant speed or VFD controlled. Single stage or multistage pump configurations are utilized depending on the required operating point.

Smaller suction lift stations are often furnished with pumps located on a steel plate over the wet well with close coupled motors. Smaller single stage stations without VFD controls often have a small control panel located adjacent to the wet well, and a small plastic housing to cover both the control panels and the pumps. If pumps are VFD controlled, a small electric building is often located at the pump station site. Larger stations with multiple pump stages often have the pumps, electrical components, and VDFs, if the station is VFD controlled, housed within an above ground pump station building located over a portion of the below grade wet well.

8.1.4 Pump Station Style Considerations

Each of the pump station styles considered have various advantages and disadvantages. Table 8-1 compares the advantages and disadvantages of each pump station style.

Based on the anticipated head conditions and discussions with pump suppliers, dry pit submersible style stations, suction lift style stations and submersible style stations can accommodate the anticipated operating points at the Urbanna pump station, the Locust Hill pump station and the Central Middlesex pump station. Due to the higher anticipated TDH at the Hartfield pump station In Middlesex Pump Stations Alternative 3, it is anticipated pumps in series would be required in the dry pit submersible station configuration or multi-stage pumps would be required in a suction lift station configuration. It is not anticipated a submersible style pump station configuration will be a viable option to meet the anticipated operating point at the Hartfield pump station.

The existing Church Street pump station in the Mathews force main system is a submersible style pump station, while the Buckley Hall, County Line and Beaver Dam pump stations are dry pit submersible stations with above ground wet wells and the pump room located at grade adjacent to the electric room. The Cook's Corner pump station, to be installed as part of MISPPI, is proposed to be a submersible pump station. In order to standardize maintenance procedures at the pump stations within the Middlesex and

Mathews systems and standardize equipment at each pump, increasing the number of stations stocked spare components are compatible with, suction lift style stations were not further considered.

Table 8-1: Pump Station Style Comparison

Style	Advantages	Disadvantages
Submersible Pump Stations	• Smaller footprint compared to dry pit submersible and larger suction lift stations • Simple pump station configuration • Typically less expensive than dry pit submersible or larger suction lift stations • Matches existing Church St. and proposed Cooks Corner Pump Station styles. Advantageous for spare maintenance parts/maintenance familiarity	• Does not accommodate pumps in series to meet higher head conditions • Pumps are more difficult to access for maintenance
Dry Pit Submersible Pump Stations	• Easier access to pumps compared to submersible stations • Can accommodate pumps in series to meet higher head conditions • Matches existing Mathews pump station style (with the exception of wet wells in Mathews being above grade). Advantageous for spare maintenance parts/maintenance familiarity	• Larger footprint • More complex pump station configuration • Typically more expensive than simple submersible or suction lift stations
Suction Lift Pump Stations	• Easier access to pumps compared to submersible stations • Can accommodate multi-stage pumps in series to meet higher head conditions • Smaller station footprint if single stage pumps meet head conditions compared to dry pit submersible stations • Single stage configuration generally less expensive	• Requires additional vacuum pump to prime the pumps • Larger footprint to meet high head conditions with multistage pumps • No other existing pump stations in the existing system are suction lift. This style station would require separate stockpile of spare parts/different maintenance procedures compared to existing pump stations in the Mathews System.

At sites where submersible pumps can accommodate the anticipated operating conditions, it is anticipated submersible style stations will be utilized as these stations are generally more economic, have a smaller footprint, and are more simple than dry pit submersible style stations. At pump stations where head conditions require pumps in series, dry pit submersible stations are anticipated to be installed.

8.2 Pump Stations

The proposed improvements to the existing pump station in the Mathews system and the proposed pump stations to be installed as part of the MISPPII project are detailed in the following sections.

8.2.1 County Line Pump Station and Beaver Dam Pump Station Improvements

In order to increase capacity in the Mathews system downstream of the connection of the MISPPII force main, pump upgrades will be required at the existing County Line and Beaver Dam pump stations. It is

anticipated the existing pumps and VFDs at the two stations will require replacement. No pipeline improvements are anticipated to be required at the station. Further evaluation of all necessary upgrades at the station will be completed during the design phase. The anticipated operating conditions and preliminary pump selections at the two pump stations are included in Table 8-2. It is anticipated the County Line pump station will be controlled by VFDs to not exceed a discharge of 431 gpm to avoid over pressurizing the existing force main.

Table 8-2: County Line & Beaver Dam Pump Station Improvements Design Criteria

Design Criteria	County Line PS
Type	Dry Pit Submersible non-clog wastewater pumps
Quantity	4, 2 sets of pumps in series (1 set duty, 1 set standby)
Capacity, each	431 gpm
Total Head	417 ft
Motor Rating	72HP, 3 phase, 460 V, 60 Hz
Manufacturers	Flygt or Approved Equal
Design Criteria	**Beaver Dam PS**
Type	Submersible non-clog wastewater pumps
Quantity	2 (1 duty, 1 standby)
Capacity, each	431 gpm
Total Head	214 ft*
Motor Rating	23HP, 3 phase, 460 V, 60 Hz
Manufacturers	Flygt or Approved Equal
*TDH identified is based on theoretical system curve developed. Pressure at the connection point to the Gloucester IFM based on maximum wet weather pressure recorded at Beaver Dam pump station between 1/1/2019 and 4/1/2020 at a discharge rate of 200 gpm and existing system configuration based on HRSD record drawings.	

8.2.2 Central Middlesex Pump Station

Two alternatives are in consideration for the location of the proposed Central Middlesex Pump Station.

For Alternative 1, the pump station is proposed to be located on an existing parking lot north of the Central Middlesex correctional facility inside a 0.21acre chain linked fenced area. Currently, the Central Middlesex Treatment Plant receives influent wastewater via an 8-inch Ductile Iron Pipe (DIP) gravity sewer. Flow will be re-directed to the proposed pump station by inserting a new manhole in the existing gravity sewer line as shown in the exhibit in Appendix H.

A climber screen system with 14-mm openings with the capacity to handle the peak flow of 50 gallons per minute (gpm) is proposed for screening. The screening system will be installed in a 20-foot deep channel and will convey the collected screenings to a 3 CY dumpster seated on a concrete pad adjacent to the screening channel. The screen channel and the dumpster will be housed under a pre-engineered canopy. In the event the screening system becomes overloaded or fails and flows begin to backup upstream of the screen, a passive overflow line is proposed to bypass the screens and send the influent directly to the wet well. Therefore, a backup debris basket screen with 51-mm openings and a stainless-

steel rail system is also proposed on the influent pipe entering the wet well to collect the debris from the screen effluent and the screen bypass line.

The wet well will be circular with 8-ft. ID and a total depth of 25-ft. A gooseneck vent pipe with a bird screen will be provided to vent the wet well. An access hatch with safety grate is proposed on top of the wet well. Two (2) 50-gpm submersible non-clog wastewater pumps are proposed in the wet well. Due to the relatively low design flows, the pumps will be constant speed in order to provide minimum scour velocities in the discharge force main. The pumps will be in a duplex configuration with one (1) duty and one (1) standby pump. The operating depth for the wet well will be measured and the pumps controlled by a level transducer with high- and low-level alarms. Backup floats will also be provided for high-high and low-low level alarms and emergency pump controls.

The discharge piping from the pumps will enter a 5-ft. X 5-ft. valve vault with 4-inch gate valves and check valves, followed by a 4-ft. X 4-ft. meter vault with one (1) 4-inch flow meter. The 4-inch effluent pipe will transition and connect to the proposed 3-inch HDPE force main that will initially convey flow from the new Cook's Corner Pump Station to the Central Middlesex Wastewater Treatment Plant (WWTP). After the new Central Middlesex Pump Station is constructed, tested, and placed in service, the direction of flow in the 3-inch force main will be reversed and the Central Middlesex Pump Station will pump to the Cook's Corner Pump Station using the same force main. Valving and piping will be installed at both pump stations to allow and facilitate this reversal of flow. An odor control unit will be provided for the wet well (Odor Ogor unit manufactured by Aerisa or carbon filter unit). The pump station control panel and the electrical panels will be housed inside a 12-ft. X 12-ft. electrical building. Backup power for the pump station and other components will be provided by a permanent generator seated on a concrete pad adjacent to the electrical building. To replace the parking lot, a new parking lot will be constructed on the site of the existing WWTP following demolition of the existing WWTP.

For Alternative 2, the pump station is proposed to be on the same site as the existing Central Middlesex WWTP. The pump station will receive the wastewater from the 8-inch DIP gravity sewer via a new manhole as shown in the exhibit in Appendix H. Construction at the existing WWTP site will require the relocation of the existing chlorine feed tank, installation of a temporary electrical and control panel for the new pump station, and installation of shoring immediately adjacent to the treatment system to allow for the excavation and installation of the new pump station facilities. This will require close coordination with the operational staff to maintain operation of the WWTP during construction. With the exception of the electrical building, which will be reused, the existing WWTP will be demolished when the proposed pump station is constructed, tested, and accepted. The permanent pump station electrical and controls will then be installed in the existing electrical building and the temporary pump station panel will be removed. While this will present additional construction and operational challenges, it will eliminate the need for long term bypass pumping of the wastewater flows during the demolition of the existing WWTP and the construction, startup and testing of the new pump station which would otherwise be required for this alternative. Long term bypass pumping is costly and carries increased risks of experiencing overflows and unpermitted discharges to Urbanna Creek.

For this alternative, the screening system will be inside an 8-ft. deep channel and the total depth of the wet well will be approximately 14-ft. The rest of the equipment design shall be similar to Alternative 1. Table 8-3 provides a summary of the various components at the Central Middlesex Pump station.

Table 8-3: Central Middlesex Pump Station Design Criteria

Design Criteria	Central Middlesex PS
Type	Submersible non-clog wastewater pumps
Quantity	2 (1 duty, 1 standby)
Capacity, each	50 gpm
Total Head	203 ft
Motor Rating	23HP, 3 phase, 460 V, 60 Hz
Manufacturers	Flygt or Approved Equal
Generator	60 KW
Screens	
Type	Bar Screens
Quantity	1
Capacity, each	50 gpm
Motor Rating	1 HP
Openings	14 mm
Manufacturer	OR-Tec or Approved Equal
Wet Well	
Type	Precast or polymer concrete
Diameter	8 ft
Basket Screen	
Type	Bar rack style trash basket
Quantity	1
Openings	51 mm
Manufacturer	Halliday or Approved Equal

An enlarged plan view of the pump station layout for Alternative 1 for the Central Middlesex Pump Station is presented in the exhibit in Appendix H. If Alternative 2 is selected, the pump station layout will be revised to accommodate the differing site conditions following the same general layout and configuration.

8.2.3 Urbanna Pump Station

Two sites are in consideration for the location of the proposed Urbanna Pump Station.

For the first site, the pump station will be located at a site on or adjacent to Tabor Park. Four (4) different alternatives are proposed for the Tabor Park site layout and are illustrated in the exhibits in Appendix H. These include:

- Alternative 1: a 200-ft. X 50-ft. site located on park property along the west property line
- Alternative 2: a 100-ft. X 100-ft. site located on park property

- Alternative 3: a 150-ft. X 150-ft. site in the vacant parcel next to the park, which was recently purchased by the Town for the Urbanna Oyster Festival
- Alternative 4: a 100-ft. X 100-ft. site located in the southwest corner of the vacant parcel next to the park. Note that this alternative may encroach on the 100-ft. buffer for the Resource Protection Area (RPA) based on its proximity to a designated wetland that potentially extends to Bristow Lane, which may require further delineation as described in section 9.2.
- Alternative 4a: a 100-ft. X 100-ft. site located in the northwest corner of the vacant parcel next to the park. Note that this alternative may encroach on the 100-ft. buffer for the Resource Protection Area (RPA) based on its proximity to a designated wetland that potentially extends to Bristow Lane. Also, it is assumed that this option would include access to the site from Bristow Lane rather than across park property. This section of Bristow Lane that would be used to access the pump station site is not maintained by the state and would require upgrades to accommodate vehicular access to the site. Due to access issues and environmental impacts, this alternative was eliminated from consideration, and as a result no figure was developed for this alternative.

For each of these site options, the existing pump station located at Tabor Park and the associated force main to the WWTP will no longer be needed and will be decommissioned and demolished after the new pump station is placed in service. The campground force main currently discharges into the existing force main, it will also need to be modified and re-routed to discharge to the gravity sewer system that feeds the new pump station. It is anticipated all four alternatives could potentially allow the decommissioning of the Tabor Lane pump station, with a gravity system conveying flows from the existing Tabor Lane pump station to the new pump station. Appendix H includes a profile from the Tabor Lane pump station to the Urbanna Pump station for the selected alternative. The proposed pump station configuration for each of these alternatives will be similar as described below.

Sections of the existing sewer will need to be removed and replaced to reverse the grade and flow to the new pump stations. The pump station wet well is proposed to be 10-ft. in diameter and approximately 20-ft. deep. A debris basket screen with a stainless-steel rail system is proposed on the influent pipe entering the wet well to collect the debris from the influent wastewater. The wet well will be vented using a gooseneck fitting with a bird screen. An access hatch with safety grate is proposed on top of the wet well. Two (2) 300-gpm submersible non-clog wastewater pumps are proposed in the wet well. Due to the higher flows, the pumps will be variable speed to provide additional operational flexibility and improved flow control in a duplex configuration with one (1) duty and one (1) standby pump. The operating depth for the wet well will be measured and the pumps controlled by a level transducer with high- and low-level alarms. Backup floats will also be provided for high-high and low-low level alarms and emergency pump controls. An additional 2 feet will be added to the wet well depth to provide some additional volume (approximately 1,175 gallons) to potentially store and equalize peak influent flows, limiting the maximum design pumping rate to 300 gpm to manage and regulate downstream flows.

The discharge piping from the pumps will enter a 5-ft. X 5-ft. valve vault with 4-inch gate valves and check valves, followed by a 4-ft. X 4-ft. meter vault with one (1) 4-in. flow meter. The 4-inch effluent pipe will transition and connect to a new 8-inch HDPE force main. An odor control unit will be provided for the wet well (Odor Ogor unit manufactured by Aerisa or carbon filter unit). The pump station control panel

and the electrical panels will be housed inside a 12-ft. X 12-ft. electrical building. Backup power for the pump station and other components will be provided by a permanent 100 KW generator seated on a concrete pad.

For Alternative 5, the pump station is proposed to be located on property adjacent to the existing Urbanna WWTP that is currently privately owned. The pump station will be in a 150-ft. X 150-ft. layout in the northwest corner of the property with an easement for the influent and effluent force mains as shown in the exhibit in Appendix H. The easement will also include a short section of gravity sewer serving the new pump station that the influent force main will discharge to and will include a manhole and stub-out for a future sewer connection from the adjacent property. After the existing WWTP has been decommissioned and demolished, a permanent new access drive to the new pump station will be provided on the adjacent WWTP site. The pump station wet well is proposed to be 10-ft. in diameter and approximately 15-ft. deep. The pump station configuration and the process equipment will be similar to Alternatives 1A and 1B. Table 8-4 provides a summary of the various components at the Urbanna Pump station.

Table 8-4: Urbanna Pump Station Design Criteria

Design Criteria	Urbanna PS
Type	Submersible non-clog wastewater pumps
Quantity	2 (1 duty, 1 standby)
Capacity, each	300 gpm
Total Head	216 ft
Motor Rating	60 HP, 3 phase, 460 V, 60 Hz
Manufacturers	Flygt or Approved Equal
Backup Power	100 KW Permanent Generator

An enlarged plan view of the pump station layout for Alternative 1 for the Urbanna Pump Station is presented in the exhibit in Appendix H. If one of the other site alternatives is selected, the pump station layout will be revised to accommodate the differing site conditions following the same general layout and configuration.

8.2.4 Locust Hill Pump Station Configuration

Based on the hydraulic analysis of the MISPPII described in section 7 it was determined two (2) proposed pump stations would be located along the MISPPII force main in addition to the Urbanna pump station. The Locust Hill pump station will be the next downstream mainline pump station from the Urbanna pump station conveying flow through the MISPPII force main (the proposed Cook's Corner and future Christchurch service area pump station will discharge into the MISPPII force main between the Urbanna pump station and the Locust Hill pump station). The Locust Hill pump station is anticipated to be a submersible pump station with flows from upstream pump stations discharging to a gravity system at atmospheric pressure before entering the wet well.

The hydraulic model was utilized to identify the approximate location of the Locust Hill pump station. Once the general location was identified for the proposed pump station, a proposed pump station site was identified through coordination with Middlesex County. The proposed site for the Locust Hill pump station is adjacent to the Saint Clare Walker Middle School on the west side of General Puller Highway. The proposed pump station site will require a total acquisition of three (3) privately owned parcels with the same property owner. An abandoned building located on the parcels will require demolition for installation of the pump station. Additionally, the proposed pump station site will require acquisition of a portion of the parcel the Saint Clare Walker Middle School is located on owned by the Middlesex County School Board.

The wet well at the Locust Hill pump station is proposed to be a 12-ft. diameter approximately 25-ft. deep precast wet well. A debris basket screen with a stainless-steel rail system is proposed on the influent pipe entering the wet well to collect the debris from the influent gravity collection systems. The wet well will be vented using a gooseneck fitting with a bird screen. An access hatch with safety grate is proposed on top of the wet well. Two (2) 300-gpm submersible non-clog wastewater pumps are proposed in the wet well. Flygt pumps were selected to meet the desired discharge rate of 300-gpm at the discharge head conditions identified at the pump station utilizing the hydraulic model.

Due to the higher flows, the pumps at the station will be variable speed to provide additional operational flexibility and improved flow control in a duplex configuration with one (1) duty and one (1) standby pump. The operating depth for the wet well will be measured and the pumps controlled by a level transducer with high- and low-level alarms. Backup floats will also be provided for high-high and low-low level alarms and emergency pump controls.

The discharge piping from the pumps will enter a 5-ft. X 5-ft. valve vault with 4-inch gate valves and check valves. A 4-ft. X 4-ft. meter vault will be provided downstream of the valve vault for metering discharged flows. The 4-inch effluent pipe will transition and connect to a new 8-inch HDPE (DIPS/DR11) force main connecting the pump station to the 8-inch HDPE (DIPS/DR11) MISPPII force main.

The pump station control panel, the electrical panels and the VFDs at the pump station will be housed inside an approximately 18-ft. X 18-ft. electrical building (final dimensions to be determined during the design phase). A restroom will be located within the electric building and drain to the gravity sewer manhole just upstream of the wetwell. An odor control unit will be provided for the wet well (Odor Ogor unit manufactured by Aerisa or carbon filter unit) and will be located within the electric building if there is sufficient space to accommodate the unit.

Potable water will be supplied to the pump station through a water service line with a reduced pressure zone backflow prevention device connecting to the proposed water main on the north side of General Puller Highway (Rte.33) to be installed as part of the Eastern Middlesex Regional Water System Improvements. Backup power for the pump station and other components will be provided by a permanent generator seated on a concrete pad. Equalization storage onsite as detailed in section 7.3.6 will be provided at the pump station. Buried HDPE equalization tanks will be utilized at the pump station to allow excess flows to enter the equalization basins via gravity flow. A yard hydrant will be provided on site for washdown of the equalization basins and pump station wet well. Table 8-5 provides a summary of the various components at the Locust Hill pump station site.

Table 8-5: Locust Hill Pump Station Design Criteria

Design Criteria	Locust Hill PS
Type	Submersible non-clog wastewater pumps
Quantity	2 (1 duty, 1 standby)
Capacity, each	300 gpm
Total Head	97 ft
Motor Rating	17HP, 3 phase, 460 V, 60 Hz
Manufacturers	Flygt or Approved Equal
Backup Power	Permanent Generator

A plan view of the Locust Hill pump station layout is presented in the exhibits in Appendix H. Appendix H also includes the anticipated service area a gravity collection system entering the Locust Hill pump station wet well at a depth of 15 ft could serve. Final pump station configuration, component sizing and pump selection will be completed during the design phase.

8.2.5 Hartfield Pump Station

The Hartfield pump station will be the next downstream mainline pump station from the Locust Hill pump station conveying flow through the MISPPII force main (the future Topping service area pump station will discharge into the MISPPII force main between the Locust Hill pump station and the Hartfield pump station). The Hartfield pump station is anticipated to be a dry pit submersible pump station with dry pit submersible pumps in series due to the anticipated head conditions identified in Middlesex Pump Stations Alternative 3 in section 7.3.2 . Flows from upstream pump stations are anticipated to discharge to a gravity system at atmospheric pressure before entering the wet well.

The hydraulic model was utilized to identify the approximate location of the Hartfield pump station. Once the general location was identified for the proposed pump station, a proposed pump station sites was identified through coordination with Middlesex County. The proposed site for the Hartfield pump station is located on a parcel owned by the Middlesex County Board of Supervisors on the west side of Wood Brothers Road. Currently the parcel serves as the Hartfield Convenience Center for recycling and trash collection. It is anticipated the proposed pump station will require the relocation of the existing convenience center. The proposed pump station site will require acquisition of a portion of the parcel. At the time of this report the final location of the pump station site has not been determined. The final location for the Hartfield pump station will be identified during the design phase.

The wet well at the Hartfield pump station is proposed to be a 10-ft. wide by 35-ft. long approximately 25-ft. cast in place wet well. A debris basket screen with a stainless-steel rail system is proposed on the influent pipe entering the wet well to collect the debris from the influent gravity collection systems. The wet well will be vented using a gooseneck fitting with a bird screen. An access hatch with safety grate is proposed on top of the wet well. Two sets of pumps in series, equaling a total of four (4) 300-gpm dry pit submersible non-clog wastewater pumps are proposed in the dry well. Flygt pumps were selected to

meet the desired discharge rate of 300-gpm at the discharge head conditions identified at the pump station utilizing the hydraulic model.

Due to the higher flows, the pumps at the station will be variable speed to provide additional operational flexibility and improved flow control with one set of pumps in series serving as the duty pumps and one set of pumps in series serving as the standby pumps. The operating depth for the wet well will be measured and the pumps controlled by a level transducer with high- and low-level alarms. Backup floats will also be provided for high-high and low-low level alarms and emergency pump controls.

The pumps will be housed in a below grade pump room adjacent to the pump station wet well. The pump room is anticipated to be approximately 20-ft. wide by 35-ft. long (final dimensions to be determined during the design phase) to accommodate the two sets of pumps in series required to meet the anticipated operating point. Discharge pipe valving and a discharge flow meter are anticipated to be housed in the pump room. The ductile iron discharge piping from the pumps will exit the station and transition to connect to a new 8-inch HDPE (DIPS/DR11) force main connecting the pump station to the 8-inch HDPE (DIPS/DR11) MISPPII force main.

Access to the pump room is anticipated to be provided through the electric room located above the pump room. The pump station control panel, the electrical panels and the VFDs at the pump station will be housed inside an approximately 20-ft. X 35-ft. electrical room (final dimensions to be determined during the design phase) located directly above the pump room. A restroom will be located within the pump station building and drain to the gravity sewer manhole just upstream of the wet well. An odor control unit will be provided for the wet well (Odor Ogor unit manufactured by Aerisa or carbon filter unit) and will be located within the electric building if there is sufficient space to accommodate the unit.

Potable water will be supplied to the pump station through a water service line with a reduced pressure zone backflow prevention device connecting to the proposed water main on the north side of General Puller Highway (Rte.33) installed as part of the Eastern Middlesex Regional Water System Improvements. Backup power for the pump station and other components will be provided by a permanent generator seated on a concrete pad. Equalization storage onsite as detailed in section 7.3.6 will be provided at the pump station. Buried HDPE equalization tanks will be utilized at the pump station to allow excess flows to enter the equalization basins via gravity flow. A yard hydrant will be provided on site for washdown of the equalization basins and pump station wet well. Table 8-6 provides a summary of the various components at the Hartfield pump station site.

A plan view of the Hartfield pump station layout is presented in the exhibits in Appendix H. Appendix H also includes the anticipated service area a gravity collection system entering the Hartfield pump station wet well at a depth of 15 ft could serve. Final pump station site, configuration, component sizing and pump selection will be completed during the design phase.

Table 8-6: Hartfield Pump Station Design Criteria

Design Criteria	Hartfield PS
Type	Dry Pit Submersible non-clog wastewater pumps
Quantity	4, two sets of pumps in series (1 set duty, 1 set standby)
Capacity, each	300 gpm
Total Head	340 ft
Motor Rating	35HP, 3 phase, 460 V, 60 Hz
Manufacturers	Flygt or Approved Equal
Backup Power	Permanent Generator

8.2.6 Cook's Corner Pump Station Modifications

The new Cook's Corner pump station that will be constructed under a separate contract in 2020/2021 is currently designed to convey flows to the Central Middlesex Treatment Plant at a design point of 35 gpm at 135 ft. TDH. Once the MISPPII force main is placed into service and the Central Middlesex Treatment Plant is decommissioned Cook's Corner will experience a change in operating conditions. To accommodate future additional flows in the Cook's Corner pump station area and new discharge conditions, the pump station will need to be modified to provide 90 gpm at 138 ft. TDH. Modifications to the Cook's Corner pump station will include the installation of new pumps and electrical improvements to accommodate the new pumps. The existing wet well is adequately sized to accommodate the additional flows with changes to the pump control settings.

8.2.7 New Mathews System Pump Station Between County Line and Beaver Dam

A new pump station is required between the existing County Line Pump station and the Beaver Dam pump station to increase the Mathews system capacity downstream of the MISPPII force main connection to 431 gpm. Friction losses through the approximately 38,000 foot long 6-inch HDPE (DIPS/DR11) force main between the existing pump stations at a flow rate of 431 gpm result in pressures in excess of the pressure rating of the pipe being required to convey the flow. Due to the length of the force main and the pressure rating of the pipe, the new pump station needs to be located almost exactly halfway between the existing pump stations to maintain pressures below the pressure rating of the pipeline downstream of the County Line pump station and downstream of the new pump station. Figure 8-1 shows the approximate location where the proposed pump station will need to be located within Gloucester County.

Figure 8-1: Proposed PS Location Between County Line PS & Beaver Dam PS

Partial or full parcel acquisition is anticipated to be required for the new pump station site. Preliminary research indicates three undeveloped parcels are present adjacent to John Clayton Memorial Highway (Rte. 14) in near the location where the new pump station needs to be located. Parcels 14632, 25216, and 17740, shown in Figure 8-2, are all between 1.75 and 2 acres in size, and are anticipated to be large enough for a new pump station. The final site location for the proposed pump station will be determined during the design phase.

Figure 8-2: Potential Pump Station Parcels

The modeled head conditions at the proposed pump station located halfway between the existing County Line pump station and the Beaver Dam pump station indicates the operating point at the pump station will be 431 gpm at 417 ft TDH. The operating point is similar to the anticipated operating point of the County Line pump station. It is anticipated dry pit submersible pumps in series, similar to those identified for the County Line pump station improvements, will be required at the new pump station to meet the anticipated head conditions.

It is anticipated a traditional dry pit submersible pump station, a dry pit submersible pump station with above ground wet wells (similar to Buckley Hall, County Line and Beaver Dam), or a PRS style station would be viable pump station styles for the proposed pump station. It should be noted that if a PRS style station is utilized, communications between the proposed pump station and the County Line pump station will be required as the proposed pump station will be required to operate any time the County Line pump station is operating to maintain pressures below the pressure rating of the pipe downstream of the County Line pump station, as no hydraulic break will be provided in the closed system.

Installation of the proposed pump station will require suction and discharge connections to the existing Mathews transmission force main. The proposed pump station site, style, and configuration will be determined during the design phase.

8.3 Central Middlesex Treatment Plant Decommissioning

The Central Middlesex Treatment Plant decommissioning plan for the two pump station location alternatives is described in the following subsections.

8.3.1 Alternative 1 – Parking Lot location

For Alternative 1, a new manhole is proposed between the two (2) existing manholes immediately upstream of the existing treatment plant. Due to the small flows associated with this facility, bypass pumping will be used to maintain flows during the installation of the new doghouse manhole, which will be scheduled to occur during a low flow period. The electrical building and pump station will be constructed, and the pumps, screening structure, and other appurtenances will be installed and commissioned. Line plugs will then be used to divert flows to the new pump station for a 30-day demonstration test. After successful completion of the 30-day demonstration test, the line to the WWTP will be permanently plugged. Following this, the treatment system can be decommissioned.

The scope of the decommissioning of the treatment includes but is not limited to the following:

- Influent pipeline
- Packaged treatment system, piping and appurtenances
- Effluent pipeline
- Electrical building
- Dechlorination tank pad

The major tasks for decommissioning of the treatment plant are as follows:

- Flushing and cleaning of all the tanks, pumps, and piping
- Demolish existing dechlorination tank pad

- Removing all tanks or structures to approximately 4-ft. below grade, punching drainage holes in the bottoms of the tanks, and backfilling to grade with clean fill material
- Disconnecting mechanical connections to the packaged treatment unit
- Disconnecting any exposed or above grade piping and valves
- Disconnecting the electrical connections to the packaged treatment unit and the control panels
- Removing any erosion and sediment control measures and perimeter fencing
- Removing instrumentation, electrical conductors and wiring, control panels, pumps, valves and fittings. Any items selected for salvage will be turned over to HRSD and the Contractor will be responsible for the removal and disposal of all remaining items
- Construct a new parking lot on the former WWTP site
- Final grading and grassing of the site.

8.3.2 Alternative 2 – Treatment plant lot

For Alternative 2, the existing WWTP site will be prepared by relocating the existing chlorine feed tank and installing sheeting for support of excavation for the new pump station construction. Temporary construction fencing will be installed as needed to safely isolate the existing WWTP operations from the construction area.

Following these site preparation activities, a new doghouse manhole will be installed between the two (2) existing manholes immediately upstream of the existing treatment plant using techniques similar to Alternative 1. The pump station will be constructed and the pumps, screening structure, and other appurtenances will be installed and commissioned. The existing dechlorination tank pad will be demolished prior to the construction of the new pump station. To help with the constructability of the new pump station while continuing to operate the existing WWTP, which will restrict the space available for constructing the new pump station, a temporary electrical panel will be installed for the pump station. After the construction and preliminary testing of the new pump station, the temporary panel will be replaced with a permanent electrical panel that is proposed to be installed in the existing electrical building after the decommissioning of the treatment plant. Alternatively, a new electrical building could be constructed adjacent to the new pump station on space currently occupied by the existing treatment plant and the existing electrical building could be removed or re-purposed and used for storage. If this alternative is selected, this will be determined during final design.

Line plugs will then be used to divert flows to the new pump station for a 30-day demonstration test of the mechanical components and the temporary electrical panel. After successful completion of the 30-day demonstration test, the line to the WWTP will be permanently plugged. Following this, the treatment system can be decommissioned, and the permanent electrical panel installed. After the permanent electrical panel is installed, a second 30-day demonstration test will be performed for the permanent electrical system.

The mechanical decommissioning scope for Alternative 2 will be similar to Alternative 1. However, for this alternative, a new parking lot will not be constructed, and the electrical building will not be demolished but will be re-used to house the permanent electrical and control panels for the proposed pump station. The rest of the decommissioning plan for Alternative 2 will be similar to Alternative 1,

noting that additional care will need to be taken to protect the new pump station during the demolition of the adjacent WWTP structures.

8.4 Urbanna Treatment Plant Decommissioning

The Urbanna Treatment Plant decommissioning plan for the two pump station location alternatives is described in the following subsections.

8.4.1 Alternatives 1-4: Tabor Park Location

For the Tabor Park location alternative, the pump station will first be constructed, installed and commissioned prior to the Urbanna Treatment Plant decommissioning. Sanitary sewer modifications will be required on Bonner Street for all four alternatives and potentially on Rappahannock Avenue (Alternative 3 only) to direct the influent to the proposed pump station. In addition to the sanitary sewer modifications, the electrical building and pump station will be constructed, and the pumps and other appurtenances will be installed, and the station will be connected to the proposed force main. Note that for this alternative, commissioning of the new pump station cannot be completed until the force main from the campground has been re-routed to discharge to the gravity system and the downstream force mains and pump stations have also been tested and commissioned and are ready to receive flow.

Line plugs in the new sanitary sewer will then be used to divert flows to the new pump station for a 30-day demonstration test. After successful completion of the 30-day demonstration test, the line to the existing WWTP will be permanently plugged. Following this, the treatment system and existing pump station can be decommissioned.

The scope of the decommissioning of the treatment plant includes but is not limited to the following:

- Existing pump station at Taber Park
- Force main to the WWTP
- Packaged treatment system, piping and appurtenances
- Effluent pipeline
- UV building
- Holding tank
- Drying beds
- Electrical and control panels

The major tasks for decommissioning of the treatment plant are as follows:

- Flushing and cleaning of all the wet well, tanks, pumps and piping
- Removing all tanks or structures, except the existing storage building, to approximately 4-ft below grade, punching drainage holes in the bottoms of the tanks, and backfilling to grade with clean fill material
- Disconnecting mechanical connections to the packaged treatment unit
- Disconnecting any exposed or above grade piping and valves
- Disconnecting the electrical connections to the existing pump station, packaged treatment unit and the control panels

- Removing any erosion and sediment control measures and perimeter fencing at the existing pump station and WWTP
- Removing instrumentation, electrical conductors and wiring, control panels, pumps, valves and fittings. Any items selected for salvage will be turned over to HRSD and the Contractor will be responsible for the removal and disposal of all remaining items
- Final grading and grassing of the site

HRSD's existing Bonner Street pump station at Tabor Park will also be decommissioned as part of this alternative.

8.4.2 Alternative 5: Mullins Property

For Alternative 5, the existing Bonner Street Pump Station at Tabor Park and its associated force main will remain in service. To access the new pump station site, which will be in the back corner of the parcel adjacent to the existing WWTP site, a temporary construction easement will be required. The influent and effluent force mains for the pump station will be in the existing utility easement. For the existing force main, a tee and valving will first be inserted, providing the option of directing flow to either the new pump station or the WWTP. The pump station and new force mains will then be constructed and tested prior to re-directing the flow to the new pump station using the new valving on the existing force main to start the 30-day demonstration test. After successful completion of the 30-day demonstration test, the force main to the WWTP will be permanently valved out and plugged. Following this, the treatment system can be decommissioned and demolished as described above.

For this alternative, the existing plant driveway is proposed to be re-used as the driveway into the pump station and will be extended to the pump station lot after the decommissioning of the treatment plant. The scope and the major tasks for the treatment plant decommissioning will be similar to Alternatives 1 through 4.

9 Permitting, Coordination & Easements

9.1 Hazardous Materials and Environmental Assessment

9.1.1 Corridor Hazardous Materials Reconnaissance Survey (CHMRS)

Based on the review of the Environmental Database Resource (EDR) search results, review of the Virginia Department of Environmental Quality (VDEQ) VEGIS online mapper and geodatabase data sets, there is low potential for fuel/contaminant release within 150 feet of the project route (project area) that may impact the project. The CHMRS identified ten (10) Recognized Environmental Conditions (RECs) based on review of active tank usage, tank removal and abandonment, date of tank installations, and property usage for those properties within the survey corridor. These RECs were identified based on the potential to disperse contaminants in the event of excavation and erosion. Detailed findings reported through EDR can be found in Appendix I. No leak related events (LTANKS, LUST) are currently open in proximity to the proposed transmission route.

As a component of this CHMRS, the environmental remediation manager for three 7-Eleven properties located within 150 feet of the selected alignment was contacted in order to identify any potential

environmental cleanup, spills, or releases at the properties. No known cleanup, spills, or releases were identified by 7-Eleven.

Based on these findings, an information request was submitted to DEQ to obtain copies of their records to confirm the extent and magnitude of the releases from the two (2) parcels along the corridor from which the majority of the environmental concerns are associated (Note: 2 parcels are tied to the same address – 2742 General Puller Highway). Based on the results from this inquiry and planned force main route, a targeted Phase II ESA is not necessary.

9.1.2 Virginia Clean Water Revolving Loan Fund Environmental Review

The MISPPII project may utilize funding from the Virginia Clean Water Revolving Loan Fund (CWRLF). The CWRLF provides a source of low-interest loan funding for improvements to public wastewater systems. The State Water Control Board develops policies and procedures for the fund, and the VDEQ Clean Water Financing and Assistance Program (CWFAP) is responsible for management and day to day operation of the CWRLF. In order to receive funding via the CWRLF, a project must undergo a rigorous environmental review process to assess the environmental impacts of proposed alternatives and ultimately select the most cost-effective, environmentally sound, and implementable alternative possible.

The CWRLF Wastewater Loan Program Guidelines identify an environmental review process similar to the National Environmental Policy Act (NEPA) process that is required during the planning stage of the project. In accordance with the CWRLF Loan Program Guidelines, a Preliminary Engineering Proposal (functionally equivalent to this PER document) is recommended as the most efficient vehicle for completion of environmental requirements and for submission to the CWFAP for approval. An environmental assessment (EA) must also be completed and submitted to the CWFAP, and to all review agencies listed in the Loan Program Guidelines, to include: VDEQ, VDOT, Virginia Department of Conservation and recreation (VDCR), Virginia Marine Resources Commission (VMRC), U.S. Army Corps of Engineers (USACE), Local Wetland Boards, Virginia Department of Agriculture and Consumer Services (VDACS), Virginia Department of Historic Resources (VDHR), and Virginia Department of Wildlife Resources (VDWR) for a 30-day review and comment period.

The EA must address and consider both direct and indirect environmental impacts for the selected alternatives as well as the no-action alternative. A list of the environmental concerns and effects that must be addressed for each of the alternatives considered is provided below. Adverse effects for each must be identified as short term (during construction phase only) or long term, and measures to avoid or minimize impacts should also be included.

- Effects, destruction and/or displacement of wildlife and marine life, including endangered species, and their habitats, or food chain,
- Destruction or disturbance of marshland or wetlands,
- Displacement of households, businesses, or services,
- Possible destruction of surrounding farmland or the loss of open space land,
- Effects on land having archeological significance,
- Destruction or disturbance of areas of historical significance,
- Use of irretrievable resources,

- Noise,
- Traffic circulation and traffic pattern disruption,
- Odor/air quality,
- Damage and/or pollution of surface water resulting from erosion, discharges or other sources,
- Aesthetic concerns and visual impacts,
- Any disturbance to designated wild, scenic and/or recreational river use,
- Socio-economic changes, and
- Floodplain impacts

Environmental impacts of the proposed alternatives must be taken into consideration for determining the selected alternative. Relative costs must be weighed against relative impacts in order to ensure that the most cost-effective and environmentally acceptable alternative is ultimately selected.

Once the agencies have been given 30 days to review and comment on the EA, and copies of the transmittal letters and review comments have been retained, the loan recipient must hold a public hearing for discussing the project and any agency review comments. Public notice for the hearing must be made at least 30 days prior to the hearing and must be published at least once a week for two consecutive weeks in a newspaper with local circulation in the project area. The Preliminary Engineering Proposal and EA must be made available for public review prior to the hearing, and a record of the proceedings must be kept.

The CWFAP will review the Preliminary Engineering Proposal, EA, transmittal letters to the agencies and comments received, the notice of public hearing, public hearing record, and the loan recipient's responses to address any agency comments (particularly any project changes deemed appropriate based on environmental effects, monetary costs, and project feasibility). The CWFAP will determine whether a Statement of Environmental Review (SER) should be issued, and if so, the SER will be sent to the loan recipient and public notice must be published in a local newspaper with circulation in the project area for 30 days. If significant adverse comments are not received from the public during this period, CWFAP will consider the environmental review complete, and will issue a clearance letter.

However, if the EA and review procedure indicates that significant environmental impacts may occur that cannot be mitigated by changes to the project, then the CWFAP may decide not to issue a SER, and a more extensive Environmental Impact Statement must then be prepared

9.1.3 Wetlands, Resource Protection Areas, Historic Resources, and Threatened & Endangered Species Overview

A preliminary wetlands assessment that included review of the United States Fish and Wildlife Service (USFWS), National Wetland Inventory (NWI), U.S. Geological Survey (USGS), National Hydrography Dataset (NHD), National Resources Conservation Service (NRCS) soils survey data, Federal Emergency Management Agency (FEMA) floodplain mapping, and EDR recent and historical aerial was completed for the project area and vicinity. A reconnaissance level field survey was also completed in order to identify wetlands or waters of the U.S. with the potential to be impacted from construction of the proposed force main and pump stations. Desktop assessment identified the presence of two major water body crossings (Piankatank River and Urbanna Creek). NWI indicated that one palustrine emergent (PEM)

wetland and one additional stream is expected to occur in the project area, within 150 feet of the proposed route. Further details and recommendations are provided in section 9.2.1.

A preliminary assessment of the project area determined that portions lie within the Chesapeake Bay Preservation Area (CBPA) overlay districts for Middlesex County and Matthews County. The CBPA Resource Protection Area (RPA) buffer is expected to occur one-hundred feet landward of the banks, including any contiguous wetlands, of the Piankatank River and Urbanna Creek. Based on the findings of the preliminary wetland's assessment, reconnaissance level field survey, and review of the CBPA overlay district maps for Middlesex County and Mathews County, no additional RPA features or areas are expected to occur within the project area. Further details and recommendations are provided in section 9.2.2.

Searches of federal and state databases for threatened and endangered (T&E) species were performed to assess potential impacts to T&E species. The federally listed as threatened northern long-eared bat (NLEB, *Myotis septentrionalis*) was listed on the Official Species List, provided by the USFWS Information Planning and Consultation System (IPaC), as likely to occur within the project area. The occurrence of state listed as endangered eastern tiger salamander (*Ambystoma tigrinum*) and state listed as threatened Mabee's salamander (*Ambystoma mabeei*) have been documented within a two-mile radius of the project area in the Virginia Department of Wildlife Resources (VDWR), Virginia Fish and Wildlife Information Service (VaFWIS) database, and Wildlife Environmental Review Map Service (WERMS). These occurrences were all located outside of the project area. The VDWR and NLEB winter habitat and roost tree application indicate that no known hibernacula or maternity roosts for NLEB exist within the project area. The Piankatank River is also listed by the VDWR as an anadromous fish use area. A review of the Virginia Department of Conservation and Recreation Division of Natural Heritage (VDCR-DNH) public access database revealed potential occurrence of federally and state listed as threatened northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) and sensitive joint-vetch (*Aeschynomene virginica*) within the project area's subwatersheds. Further details regarding these findings are provided in section 9.2.3.

A review of the Virginia Department of Historic Resources (VDHR) and Virginia Cultural Resource Information system (V-CRIS), along with a review of previous surveys completed along the route, identified four properties (archeological and architectural) listed under the National Register of Historic Places (NRHP), one archaeological property that is eligible for listing, and 13 properties that have not yet been evaluated for listing eligibility within the project area or in the surrounding area. Further details regarding these findings are provided in section 9.2.4.

Detailed information regarding preliminary reviews of water resources, CBPA, RPAs, and T&E species is provided in section 9.2 below and in Appendix J.

9.2 Environmental Permitting

9.2.1 WETLANDS AND WATERS

The project area ultimately drains to the Chesapeake Bay via the Piankatank River and Urbanna Creek. This project area occurs within the following subwatersheds, also identified by 12-digit hydrologic unit code (HUC): Lagrange Creek-Rappahannock River (020801040603), Carvers Creek-Piankatank River (020801020301), Carter Creek-Rappahannock River (020801040704), Locklies Creek-Rappahannock

River (HUC 020801040705), Wilton Creek-Piankatank River (020801020302), and North River (020801020404).

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Middlesex County and Mathews County (Panels 51115C0045E, 51115C0010E, 51119C0220E, 51119C0215E, 51119C05E, 51119C0185E, 51119C0180E and 51119C0114E), portions of the project area lie within Zone AE (EL 6 Feet) at Urbanna Creek, and portions of the project area lie within Zone VE (EL 7 and 11 Feet), AE (EL 6 Feet), and X-shaded (0.2 Percent Annual Chance Flood Hazard) at the Piankatank River. The remainder of the project area lies in the Zone X Area of Minimal Flood Hazard.

The proposed project involves crossing the Piankatank River and Urbanna Creek via HDD. The Piankatank River is an approximately 24-mile-long primarily tidal river that ultimately drains to the Chesapeake Bay. Urbanna Creek is an approximately 3.5-mile-long tidal tributary of the Rappahannock River. Authorization will be required by the United States Army Corps of Engineers (USACE), VDEQ, and the VMRC for the HDD crossings of these waters, and a plan to prevent inadvertent return of drilling fluids or spoil into waters of the U.S. will be required.

As mentioned above, one small PEM wetland and one additional stream were identified by the NWI in the project area. A reconnaissance level field survey was conducted by staff wetland scientists on April 29, 2020, which involved roadside observation with photos and GPS coordinates taken at the locations of suspected features. Reconnaissance revealed the potential presence of three small PEM wetlands within the Matthews County portion of the project area, and five small PEM wetlands within the Middlesex County portion of the project area, near road rights-of-way. The reconnaissance survey also identified the locations of several stormwater management BMPs (dry detention ponds) and several roadside drainage ditches that may be affected by the project. It is advised that these features be avoided to the greatest extent practicable. Based on the field survey and current design, temporary impacts to less than one acre of PEM wetlands is anticipated for the proposed activities.

It is recommended that a wetland delineation be conducted in the field by qualified personnel. A field visit should be completed with staff from the appropriate regulatory agencies to confirm any delineated features and to discuss anticipated impacts and potential restoration requirements. An approved or preliminary jurisdictional determination must be received from the USACE prior to submission of a Joint Permit Application (JPA). The JPA is used by multiple regulatory agencies to determine whether a project qualifies for certain general, regional, and/or nationwide permits for work in wetlands or waters of the United States. Applicable primary agencies include the following:

- Virginia Marine Resources Commission (VMRC)
- U.S. Army Corps of Engineers (USACE)
- Virginia Department of Environmental Quality (VDEQ)
- Middlesex County and Mathews County Local Wetlands Boards (LWBs)

The JPA may also be distributed to secondary agencies at the discretion of the primary agencies, including, but not limited to the USFWS, VDWR, VDCR-DNH, and VDHR. It is anticipated that a Nationwide Permit 12 (NWP-12) will be required by the USACE, and a permit package will be submitted to VMRC for the HDD crossing of the Piankatank River and Urbanna Creek (Note: VMRC does not issue a permit for HRSD projects that use state-owned subaqueous bottoms for the construction or maintenance of its

sewage disposal facilities and instead rely on formal approval from the Governor). Approval from the Middlesex County and Mathews County wetlands boards are not required for this project, as HRSD is considered a political subdivision of the Commonwealth of Virginia. Further details regarding the permitting requirements by the individual agencies/municipalities are provided in section 9.3.

9.2.2 CBPA

In accordance with local county ordinance articles (Middlesex (4A) and Mathews(22)), adopted under the authority of Sections 10.1-2108, 10.1-2109, 10.1-2111 and 15.2-2283 of The Code of Virginia (The Chesapeake Bay Preservation Act), portions of the MISPPII project contain protected areas within Middlesex County and Matthews County Chesapeake Bay Preservation Area (CBPA) Preservation Overlay Districts. The Chesapeake Bay Preservation Area Overlay Districts apply to all lands identified as Resource Protection Areas (RPAs) and qualifying as Resource Management Areas (RMAs). The RPA includes all tidal wetlands, non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow, tidal shores, and a vegetated buffer area 100 feet in width located adjacent to and landward of all other listed components, and along both sides of any water body with perennial flow. In both counties the actual boundaries of the RPA are determined on a case-by-case basis.

As described in section 9.1.1, known RPA features in the Middlesex County portion of the project area include the Piankatank River and Urbanna Creek. In the Mathews County portion of the project area, known RPA features include the Piankatank River. No additional RPA features were observed during the field reconnaissance survey.

In Middlesex County, the RMA includes the 100-year floodplain, non-tidal wetlands not connected by surface flow and contiguous to tidal wetlands and water bodies with perennial flow or other tidal waters, highly erodible and permeable soils, slopes in excess of fifteen percent, and a one-hundred fifty foot linear distance from the landward side of the RPA. This includes the shoreline and contiguous wetlands of the Piankatank River and Urbanna Creek. In Mathews County, the RMA includes the 100-year floodplain, highly erodible soils, including steep slopes, highly permeable soils, and nontidal wetlands not included in the RPA.

Per 4A-14B of the Middlesex County Zoning Ordinance and 22.47B of the Mathews County Zoning Ordinance, construction, installation, and maintenance of sewer lines owned, permitted or both, by a local government or regional service authority are exempt from the requirements of the CBPA Overlay District.

Coordination with Middlesex County and Mathews County may be required to ensure that all project activities are exempt from the requirements of the CBPA ordinance per the following conditions:

1. To the degree possible, the location of such utilities and facilities should be outside the RPA;
2. No more land shall be disturbed than is necessary to provide for the proposed utility installation;
3. All such construction, installation, and maintenance of such utilities and facilities shall follow all applicable state and federal requirements and permits and designed and conducted in a manner that protects water quality; and,
4. Any land disturbance exceeding an area of 2,500 square feet complies with the Middlesex County Erosion and Sedimentation Control Ordinance.

The location of all CBPA features, including the RPA and RMA boundaries may need to be delineated in the field by qualified personnel and verified by the Middlesex County Planning Department, as the CBPA boundaries are a required component of the project erosion and sediment control plan for the Middlesex County Land Disturbance Permit Application (see section 9.2.5).

9.2.3 T&E

The following agencies and associated databases were reviewed in order to assess the potential presence of Endangered Species Act (ESA) listed species within or in the vicinity of the project area:

- U.S. Fish and Wildlife Services (USFWS) – Information, Planning and Consultations system (IPaC)
- The Center for Conservation Biology (CCB) – VaEagles Nest Locator
- Virginia Department of Wildlife Resources (VDWR) - Virginia Fish and Wildlife Information Service (VaFWIS) and Wildlife Environmental Review Map Service (WERMS)
- Virginia Department of Conservation and Recreation (VDCR) – Division of Natural Heritage (DNH) database

An Official Species List produced by the USFWS IPaC revealed that the federally listed as threatened NLEB is expected to occur within the MISPPII project area. The USFWS has provided an online IPaC determination key for the NLEB in order to streamline Section 7 consultation for this species, since federal actions that cause incidental take are not prohibited in accordance with the 2015 USFWS Programmatic Biological Opinion on the Final 4(d) Rule for the NLEB and Activities Excepted from Take Prohibitions. The IPaC key also generates an effects determination for the species (See Appendix J). The IPaC search results are valid for 90 days and will need to be updated prior to submission of a JPA.

In accordance with the findings of the IPaC determination key for NLEB, the proposed action is consistent with the excepted from take prohibitions addressed in the Programmatic Biological Opinion, and while the action "may effect" the NLEB, any take that may occur as a result of the action is not prohibited under the ESA Section 4(d) rule for this species. A recent court ruling on January 28, 2020, *Center for Biological Diversity v. Everson, No. 1:15-cv-00477 (D.D.C. 2020)*, remanded the USFWS 2015 decision to list NLEB as "threatened." The NLEB will remain listed as threatened until the USFWS re-evaluates and makes a final decision on whether to re-list this species as "endangered." There is currently no timeline provided for when this will occur. If the USFWS relists the NLEB as "endangered," the 4(d) rule will no longer apply and incidental take of any kind may require an incidental take permit (Cowen 2020). A verification letter for this determination was generated on May 10, 2020 which verifies that responsibilities for this action under ESA 7(a)(2) are concluded with respect to NLEB (See Appendix J).

The Bald Eagle (*Haliaeetus leucocephalus*) is protected under the Bald and Golden Eagle Protection Act. The Act prohibits anyone from taking or disturbing bald eagles and their nests. Activities within 200 meters of a documented Bald Eagle nest may require a permit. According to the Center for Conservation Biology (CCB) VaEagles Nest Locator on-line tool, the closest documented Bald Eagle nest is located approximately one half-mile northeast of the project area, at Rosegill Lake. Therefore, no Bald Eagle Permits are anticipated to be required (Appendix J).

A review of the VDWR VaFWIS and WERMS data revealed historical species observations of two state listed species within a two-mile radius of the project route. A VaFWIS report and WERMS exhibit are provided in Appendix J.

- Eastern tiger salamander (*Ambystoma tigrinum),* state endangered (SE)
- Mabee's salamander (*Ambystoma mabeei),* state threatened (ST)

These two species are declining in the southeastern United States as a result of deforestation and loss of wetland habitats. They are generalist species with respect to terrestrial habitats, but reproduction is largely dependent on fishless bodies of water such as vernal pools (NatureServe 2020). No impacts to vernal pools are proposed for this project and impacts to wetlands will be avoided and minimized to the greatest extent practicable. The Piankatank River is also listed by the VDWR as an anadromous fish use area. As a result, a time of year restriction for any in-water work in the Piankatank River (from February 15 – June 30, if applicable) may be imposed as a regional condition for permits required for the crossing.

A review of the VDCR-DNH public access database revealed potential occurrence of two federal and state listed species within the subwatersheds affected by the project area

- Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*), federally threatened (FT), ST
- Sensitive joint vetch (*Aeschynomene virginica*), FTST

No potential habitat for sensitive joint vetch will be impacted by project activities. This species depends on open freshwater tidal wetland habitat. Only twelve (12) occurrences of this species are documented in Virginia. Habitat alteration is the primary threat to the species' continued existence. Many sites where it occurred historically have been dredged, filled or bulkheaded (NatureServe 2020). No dredging, filling, or bulkheading is proposed in tidal wetlands during project activities, as HDD is the selected method for installation of the force main at the Piankatank River and Urbanna Creek water crossings. Therefore, no adverse effects to this species are anticipated.

No potential habitat for northeastern beach tiger beetle will be impacted by project activities. This species depends on sandy beach and dune habitat, and only occur from approximately the foredune to the high tide line on ocean and bay beaches. Larvae live in burrows in the sand. Major causes of decline for this species include vehicular use and foot traffic on beaches, severe storms, beach replenishment, and beach stabilization activities (NatureServe 2020). No work on beaches is proposed for this project, therefore, no effect to northeastern beach tiger beetles is anticipated. If any observations of the above listed species occur or if disturbance to potential habitat is proposed within the APE, further coordination with the USFWS, VDWR, and VDCR-DNH may be necessary. Database search results are provided in Appendix J.

9.2.4 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act (NHPA), governed by *36 CFR 800* (*Protection of Historic Properties*), requires any Federal undertaking to be preceded by correspondence with the Advisory Council on Historic Preservation (ACHP) regarding historic properties and potential effects. Undertakings includes any project, activity, or program that is either funded, permitted, licensed, or approved by a Federal Agency. As such, the corridor analysis included a preliminary cultural assessment (Phase 1A Assessment) for the force main routing, pump locations, and HDD proposed locations. This assessment included routes through Middlesex and Mathews Counties and spanned prehistoric context and all previously recorded cultural resources. Assessment included review of V-CRIS and recent surveys completed within the proposed route.

According to a Phase 1A Assessment for the MISPPII, completed in May 2020, there are no archaeological or architectural resources recorded for the Mathews County component of the project. The HDD drill rig location on the north side of the Piankatank River is adjacent to the 1953 John Andrew Twigg Bridge (VDHR ID# 057-5047) which was determined by the VDHR to not be eligible for listing in the National Register. Additionally, a survey completed by the Chesapeake Watershed Archaeological Research Foundation found no significant resources along the south shore of the Piankatank River within vicinity to the HDD pipe proposed location (Lowery 2008).

The remaining areas reviewed in the Phase 1A Assessment include the proposed pump stations (including alternates) and the Transmission Force Main (TFM) through Middlesex County, excluding the 5.3-mile section between Cook's Corner and Harmony Village. This location was removed from assessment due to the proposed placement of the TFM within VDOT right-of-way. The results of this Phase 1A Assessment includes the following archeological/architectural resources within, adjacent to, or within the vicinity of the project area: 1 listed archaeological district (VDHR ID 316-0009), 3 architectural properties or districts (VDHR ID: 059-0009, 059-0007, 059-0010), one district that is eligible for listing (VDHR ID: 059-5124), 13 properties that have not been evaluated, and 12 properties that were determined to not be eligible for listing. These findings suggest that discovering significant and intact archaeological resources along the proposed route is low. Given the lack of archeological sensitivity, it is not anticipated that a Phase 1B Cultural Assessment will be required for the proposed TFM. However, project design should avoid direct impacts within the defined boundaries of Rosegill (VDHR ID# 059-0009) and Wilton (VDHR ID# 059-0010), which are both architectural resources listed in the National Register/Virginia Landmarks Register and are adjacent to the proposed project. If any impacts to the above-mentioned archaeological or architectural resources are proposed for the final project design, further coordination with VDHR will be required. If VDHR determines that the project may result in adverse effects to archaeological resources, tribal consultation may be required under section 106 of the NHPA.

9.2.5 EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT

In accordance with the Virginia Erosion and Sediment Control Law, Regulations, and Certification Regulations, VDEQ implements the state Erosion and Sediment Control program (effective July 1, 2013) to help prevent destruction of property and natural resources caused by soil erosion, sedimentation and nonagricultural runoff from regulated land-disturbing activities. A land-disturbing activity is "any land change on private or public land that may result in soil erosion from water or wind and the movement of sediments into state waters or onto lands in the Commonwealth, including, but not limited to, clearing, grading, excavating, transporting and filling of land." This definition includes land-disturbing activities equal to or exceeding 10,000 square feet.

While VDEQ oversees the state program, local governments regulate most private and locality projects involving land-disturbing activities. As authorized by the Code of Virginia, Title 10.1, Chapter 5, Article 4 (Sec. 10.1-560 et seq.), Middlesex County and Mathews County both require any contractor, firm, corporation, or other public/private agency to complete a land-disturbance/disturbing permit application for any work which will disturb 10,000 square feet or more of land as described in the County Erosion and Sediment Control (ESC) Ordinances and to be approved by the respective County Planning Departments. Disturbed land areas greater than 2,500 square feet in size and located within the CBPA also require a land-disturbing permit.

Under the ESC Ordinances for both Middlesex and Mathews Counties, the installation, maintenance, or repairs of any underground public utility lines is not considered a land-disturbing activity when such activity occurs on an existing hard-surfaced road, street or sidewalk provided the land-disturbing activity is confined to the area of the road, street or sidewalk which is hard-surfaced. It is anticipated that the MISPPII project will require a land-disturbing permit from both counties, as most of the proposed transmission force main and pump stations will not be sited under existing hard surfaces.

Pursuant to the provisions of the Clean Water Act (CWA) and the Virginia Stormwater Management Act and regulations, operators of construction activities must also be authorized to discharge to surface waters of the Commonwealth of Virginia. The Virginia Department of Environmental Quality (VDEQ) administers the program as the Virginia Pollutant Discharge Elimination System (VPDES), and issues VPDES permits for dischargers of stormwater from construction activities. Because greater than one acre of land-disturbing activity is anticipated during construction of the MISPPII project, it is anticipated that a 2019 general VPDES permit for discharges of stormwater from construction activities (General Permit No. VAR10) will be required.

9.3 Agency Approvals

The design and construction of the proposed force main and associated pump stations will require the acquisition of several permits and further investigation to fulfill the requirements of federal, state, and local regulatory authorities. As previously discussed, additional requirements and environmental review from many of the agencies discussed below may also be initiated if the CWRLF is utilized as a funding sources for the project.

Numerous stakeholders will be affected by this project. Early stakeholder coordination will be required for the timely completion of the project. All assumptions stated herein are subject to review and approval by the respective agency at the time of permitting.

As described in section 9.2.1, a JPA is used to apply for permits from multiple regulatory agencies for work in waters of the United States (including wetlands) within the jurisdiction of Virginia, including the USACE, VMRC, VDEQ, and LWBs. VMRC serves as the clearinghouse and distributes submitted JPAs to the appropriate agencies once they are received. Such work may include construction, dredging, filling, excavation, or encroachment in the waters or in wetlands. It is anticipated that a JPA will be required for this project to address the waterway crossings for the Piankatank River and Urbanna Creek, as well as for any additional impacts to wetlands within the proposed route.

HRSD generally conducts a public meeting for general education of interested public for projects impacting public right-of-way. Affected stakeholders are discussed below.

9.3.1.1 US ARMY CORPS OF ENGINEERS (USACE)

Under the provisions of Sections 404 and 401 of the CWA and the Rivers and Harbors Act, the U.S. Army Corps of Engineers administers both Nationwide and Individual permits for projects involving the discharge of dredged or fill material into navigable waters of the United States. The purpose of the Nationwide Permit Program is to streamline the evaluation and approval process throughout the nation for certain types of activities that have only minimal impacts to the aquatic environment.

It is anticipated that a permit will be required by the USACE for the crossings of the Piankatank River and Urbanna Creek, as well as for any additional wetland areas impacted by the proposed route. The preliminary reconnaissance field survey found that minor impacts of less than an acre to wetlands and waters of the U.S. are anticipated. Most impacts are expected to be temporary in nature. Prior to the submission of a JPA, a wetland delineation must be completed, and a jurisdictional determination must be received from the USACE. Site verification field visits with the USACE are typically scheduled between 30 to 60 days following submission of a jurisdictional determination request.

Due to the nature of the proposed work and the relatively minor impacts expected, this project is likely to qualify for authorization under Nationwide Permit 12 (NWP-12) for Utility Line Activities. Per the special condition 9 for NWP-12, utility line projects completed by horizontal directional drilling or other boring methods must include a plan in the JPA to address the prevention, containment, and cleanup of sediment or other materials caused by inadvertent returns of drilling fluids to waters of the U.S. through sub-soil fissures or fractures. For all submerged utility lines across navigable waters of the United States, a location map and cross-sectional view showing the utility line crossing from bank to bank is a required component of the JPA.

Certain project activities may also qualify in combination with Nationwide Permit 33 for Temporary Construction, Access and Dewatering. Alternatively, if authorization under NWP-12 is not possible, this project would likely also qualify for authorization under a State Programmatic General Permit (SPGP), which are issued by the USACE, but are coordinated and authorized by the VDEQ regulatory program.

If temporary impacts to wetlands are proposed, permits issued by the USACE and/or the VDEQ may incorporate project specific conditions. Such conditions may include, but are not limited to, biannual or monthly monitoring of disturbed wetland areas post-construction for a period of up to three years, or inclusion of native seeding and planting requirements into the Contract Documents. Additionally, any permanent structures or access ways for future operations and maintenance efforts may require mitigation if such installations impact wetland areas and result in a net loss of acreage or wetland system functionality.

In order to ensure that Federal Civil Works projects continue to provide their intended benefits to the public, Congress mandated that any use or alteration of a Civil Works project by another party is subject to the approval of USACE. This requirement was established in Section 14 of the Rivers and Harbors Act of 1899, which has since been amended several times and is codified at 33 USC 408 (Section 408). A USACE federal navigation project is located in close proximity to the project area, within Urbanna Creek. Confirmation was received from USACE staff stating that this federal navigation project will not be impacted by the MISPPII project activities, and therefore no separate section 408 review is required for the HDD crossing of Urbanna Creek. The USACE is the lead federal agency for the Chesapeake Bay Native Oyster Recovery Program, authorized by Section 704(b) of the Water Resources Development Act (WRDA) of 1986, as amended by Section 342. On-going and upcoming efforts of this program include the design, monitoring and construction of oyster reefs throughout the Piankatank River. Confirmation was received from USACE staff stating that this USACE Aquatic Ecosystems Restoration Project will not be impacted by the MISPPII project activities, and therefore no additional section 408 review is required for the HDD crossing of the Piankatank River.

9.3.1.2 VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (VDEQ)

VDEQ administers Virginia Water Protection Permits for wetlands disturbance, but generally waives comment when a Nationwide Permit is issued by the USACE. In accordance with Section 401 of the Federal CWA, any Federal license or permit to conduct an activity that may result in a discharge to waters of the United States must first receive a water quality certification from the state in which the activity will occur. In Virginia, VDEQ is the agency responsible for issuing Section 401 certification. However, under the 2017 USACE Nationwide Permit Program, Section 401 Water Quality Certification has been provided, either conditionally or unconditionally, for many Nationwide Permits, with no separate Virginia Water Protection permit being required by VDEQ. Therefore, if an NWP-12 is issued by the USACE for this project, a separate VWP permit from VDEQ is not likely to be required.

Sewerage projects must be approved by the VDEQ Office of Wastewater Engineering for compliance with the *Sewage Collection and Treatment Regulations*; and typically require a Certificate to Construct (CTC) and a Certificate to Operate (CTO). Kimley-Horn contacted the VDEQ Office of Wastewater Engineering for clarification on the SCAT regulations pertaining to the design pumping capacity for the pump stations proposed for this project since they are not being designed to pump peak flows and instead are utilizing equalization to store wet weather flows. VDEQ's response was that there will be some presumption that the PE-stamped CTC and CTO applications will be submitted only after the design professional has determined what equalization capacity is required to meet the reliability class of the pump station.

As described in section 9.2.5, VDEQ also administers the VPDES program and issues permits for stormwater discharges from construction activities. A 2019 VPDES Construction General Permit (VAR10) will be required from DEQ for the project construction.

VDEQ implements Virginia Erosion and Sediment Control Program, and VDEQ is also the Virginia Stormwater Management Program (VSMP) authority for both Middlesex County and Mathews County. In order to receive coverage under the VPDES VAR10 permit, a registration statement must be submitted to the VSMP authority (VDEQ) and a stormwater pollution prevention plan (SWPPP) must be prepared prior to submitting the registration statement per 9VAC25-880.

VDEQ CWAP also oversees and ultimately certifies the environmental review process required for a project to receive funding under the CWRLF. The VDEQ CWFAP makes its determination based on review of the Preliminary Engineering Proposal, EA, and comments from multiple agencies (VDOT, VDCR, VMRC, USACE, LWBs, VDACS, VDHR and VDWR).

9.3.1.3 VIRGINIA MARINE RESOURCES COMMISSION (VMRC)

VMRC regulates impacts and encroachments to activities in, on, or under State-owned submerged lands, tidal wetlands, and dunes/beaches under Code of Virginia Title 28.2, Chapters 12, 13, and 14. When issuing permits, VMRC considers effects on other reasonable and permissible uses of state waters and state-owned bottomlands, marine and fisheries resources of the Commonwealth, tidal wetlands, adjacent and nearby properties, water quality and submerged aquatic vegetation.

The Piankatank River and Urbanna Creek crossings proposed for this project will require the submission of a JPA which is used by the USACE, VMRC, VDEQ, and the LWBs for permitting purposes. Submarine

crossings are normally permitted by VMRC if reasonable measures are taken to protect aquatic resources and other uses of the waterway.

VMRC regulated private oyster ground leases occur within the project area at the Piankatank River and Urbanna Creek crossings. Per the VMRC subaqueous guidelines, any alteration of submerged aquatic vegetation, shellfish beds and wetlands should be minimized wherever possible in the planning and location of submerged structures. In general, HDD methodologies are preferred by VMRC over trenching.

9.3.1.4 USFWS

Impacts to threatened and endangered species are regulated under various federal laws including the ESA and the National Environmental Policy Act (NEPA). Coordination with the USFWS regarding potential impacts to threatened and endangered species is a required component for submission of a JPA. Under Section 7 of the ESA, Federal agencies must consult with the USFWS when any action the agency carries out, funds, or authorizes (such as through a permit) may affect a listed endangered or threatened species. This process usually begins as informal consultation. Since the USACE is the lead federal agency responsible for authorizing project permits (for compliance with CWA section 401/404), the agency is subject to ESA requirements to initiate Section 7 Consultation with the USFWS.

A review of the USFWS Official Species List for the project area found that one species, NLEB, has the potential to occur within the project area. In accordance with the findings of the IPaC determination key for NLEB, the proposed action is consistent with the excepted from take prohibitions addressed in the Programmatic Biological Opinion, and while the action “may effect” the NLEB, any take that may occur as a result of the action is not currently prohibited under the ESA Section 4(d) rule for this species. Therefore, it is not anticipated that an incidental take permit or time of year restriction for tree clearing will be required.

9.3.1.5 VIRGINIA DEPARTMENT OF WILDLIFE RESOURCES (VDWR)

Impacts to Virginia listed threatened and endangered species are regulated under the Virginia Endangered Species Act, as provided by Article 6 (§ 29.1-563 et seq.) of Chapter 5 of Title 29.1 of the Code of Virginia and Virginia Administrative Code, 4VAC15-20-130. The regulatory agency responsible for enforcement of these laws is VDWR. VDWR also serves as a consulting agency under the U.S. Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and provides environmental analysis of project and/or permit applications coordinated through the VDEQ, VMRC, the Virginia Department of Transportation (VDOT), the Federal Energy Regulatory Commission (FERC), USACE, and other state or federal agencies.

A preliminary review of available data from VDWR VaFWIS and WERMS data identified confirmed observations of two threatened or endangered species within two miles of the project area; eastern tiger salamander and Mabee’s salamander. Based on the VDWR species observation information and the absence of critical habitat designations made within the project area, it is not anticipated that adverse impacts to these species will occur as a result of construction activities. However, further coordination with VDWR is recommended prior to construction to ensure that no permits or restrictions are required.

9.3.1.6 VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION – DIVISION OF NATURAL HERITAGE (VDCR-DNH)

VDCR-DNH serves in an advisory capacity and is tasked to maintain Virginia's Natural Heritage Program and to provide recommendations to the VDWR on species and land management in order to identify, maintain, and preserve the natural diversity of biological resources of the Commonwealth. A review of the VDCR-DNH public access database for the affected subwatersheds revealed potential occurrence of two Federal and State listed species; Northeastern beach tiger beetle and sensitive jointvetch. It is not anticipated that adverse impacts to these species will occur as a result of construction activities. However, further coordination with VDCR-DHR is recommended prior to construction to ensure that no permits or restrictions are required.

9.3.1.7 VIRGINIA DEPARTMENT OF HISTORIC RESOURCES (VDHR)

VDHR performs primary review of federally-assisted or permitted projects and serves in an advisory capacity to federal agencies and their designees in fulfilling responsibilities under section 106 of the NHPA. The State Historic Preservation Officer (SHPO), which in Virginia is the director of the VDHR, coordinates state implementation of the NHPA and plays a key role in the section 106 process. If the SHPO determines the project will result in no effect to historic properties, the review period is typically 30-days. If the SHPO determines no adverse effect to historic properties, and no objection is received from any consulting party review, then the review period is also typically 30-days. If the SHPO determines the project may result in adverse effects to the historic, consultation with interested parties (such as federally recognized tribes) may be required and would result in a potentially longer timeframe for permit approvals (length not specified). A summary of historic resources within the vicinity of the project are described in section 9.2.4 and in the Preliminary Cultural Resources Assessment completed for the project.

9.3.1.8 VDOT

Work within the right-of-way in Middlesex and Mathews Counties will be as authorized by VDOT. Construction within the right-of-way is anticipated to require a VDOT land use permit. Coordination with VDOT requirements at each valve site within VDOT right-of-way will be coordinated with the VDOT Saluda Residency during design.

9.3.1.9 MIDDLESEX COUNTY

<u>Land Disturbance Permit</u>

Middlesex County Land Disturbance Permit (LDP) applications are processed by the Department of Planning and Community Development. As mandated by the Section 4VAC50-30-40 of the State erosion and sediment control regulations and the Middlesex County LDP application, the project must comply with the minimum standards and county specific general condition where applicable.

<u>Floodplain Ordinance</u>

The Middlesex County Virginia Floodplain Ordinance adopted pursuant to the authority granted to localities by Virginia Code 15.2 - 2280, governs constructions activities/development within flood-prone zones. While the proposed pump locations do not occur within FEMA based flood zones, the TFM is

anticipated to cross AE and AO FIRM based zoning districts. Activities within these zones may be regulated by the Floodplain Ordinance and, as such, may require flood-proofing or reasonably safe designs. Permits and applications related to construction within the flood zone are processed by the Department of Planning and Community Development.

Local Wetlands Board

Impacts, alteration, and development within tidal wetlands are reviewed by the Middlesex County Wetlands Board pursuant to the Virginia Code 28.2-1303, Middlesex County Wetlands Ordinance, and the Coastal Primary Sand Dunes and Beaches Ordinance. Since HRSD is a political subdivision of the Commonwealth of Virginia, pursuant to § 28.2-1302 of the Code of Virginia HRSD projects are considered exempt as they are "Governmental activity in wetlands owned or leased by the Commonwealth or a political subdivision thereof." Therefore, this project is not subject to Wetland Board Approval.

CBPA Planning Division

Impacts and development within CBPA RPA's are reviewed by the Middlesex Department of Planning and Community Development, pursuant to the Middlesex County Virginia Zoning Ordinance Article 4A. Section 4A-14, subsection B, stipulates requirements for local utility exemptions for which the proposed project would qualify. It is not expected that a full application or water quality impact assessment would be required for the exemption request.

9.3.1.10 MATHEWS COUNTY

Land Disturbing Permit

County of Mathews Department of Planning and Zoning processes LDP Application. Permit application requires conformance with standards and specifications as they relate to ordinances adopted by Mathews County, unless variances are approved. The project must comply with state ordinance for Erosion and Sediment Control and all general conditions of the LDP application.

Floodplain Ordinance

The Mathews County Virginia Floodplain Management Ordinance adopted pursuant to the authority granted to localities by Virginia Code 10.1 - 600 et. Seq., governs construction activities/development within flood-prone zones. The proposed TFM will pass through VE FIRM based zoning districts via HDD. Beyond that, it is expected that the construction of the TFM will not occur within flood-prone districts. A Flood Zone Development Permit will be required for this activity and is administered by the Mathews County Building Department.

Local Wetlands Board

Impacts to tidal wetlands are regulated via a locally elected Wetlands Zoning Board, pursuant to Code of Virginia 28.2-1303 and Chapter 166 of the Code of Mathews. Since HRSD is a political subdivision of the Commonwealth of Virginia, pursuant to § 28.2-1302 of the Code of Virginia HRSD projects are considered exempt as they are "Governmental activity in wetlands owned or leased by the Commonwealth or a political subdivision thereof." Therefore, this project is not subject to Wetland Zoning Board Approval.

CBPA Planning Division

Impacts and development within CBPA RPA's are reviewed by the Mathews County Planning, Zoning and Wetlands Office, pursuant to the Zoning Ordinance of Mathews County, Virginia Article 22. Article 22, Division V (22.47, Subsection 2) defines project requirements for exemptions related to RPA impacts associated with sewer utility projects. It is expected that an exemption application would be approved by the Mathews County Planning, Zoning and Wetlands Office for this project.

9.4 Stakeholder Coordination/Public Outreach

Because of the size and scope of this project, numerous stakeholders will be affected by the project. HRSD generally posts project updates on their websites and conducts public meetings for general education of the interested public for projects impacting the public right-of-way. In addition to these typical methods, additional more targeted methods are recommended for this project as this will help ensure the right message is being delivered about the project's purpose which will help build consensus for the project. This would include presentations at Middlesex and Mathews Counties Board of Supervisors meetings and to the Urbanna town council as well as presentations to the communities of Cook's Corner/Christchurch, Locust Hill, Topping, and Hartfield communities. A project website is recommended that will be used to provide project information, updates, and allow questions/comments to be submitted by the public. If permitted, this project website can be accessed through the Town of Urbanna and Middlesex and Mathews Counties webpages or hosted independently. In some cases, personal meetings with property owners will also be necessary in areas where easements are needed or where more clarification is requested about property impacts.

Middlesex and Mathews Counties, the Town of Urbanna, and VDOT will also be involved in the design review process for the project.

9.5 Easement and Parcel Acquisition

Generally, the proposed force main alignment can be located within the right-of-way. In areas where this cannot be achieved, both temporary construction easement and permanent easement will need to be acquired for installation of the force main. Temporary construction easements are anticipated to be required for construction of the force main, accommodating HDD staging areas, HDD pipe string-out areas, and construction of jack and bore pits. Permanent easement is necessary in areas where the proposed force main alignment crosses private property to allow for future maintenance and accessibility.

Most of the easements needed for the new force main are located on Twiggs Ferry Road between General Puller Highway and the Piankatank River bridge where the existing road falls within a prescriptive easement according to Middlesex County GIS information. However, preliminary research of VDOT right of way plans for Twiggs Ferry Road indicates that a 66-foot wide right of way was established between the Piankatank Bridge and General Puller Highway. Per VDOT's Appraisal Guide, a prescriptive easement is created using another's land over a period of time. While VDOT has use of the prescriptive easement for roadway purposes, the underlying fee ownership remains with the property owner on both sides of the roadway. While the property owner may have purchased and paid taxes on acreage including the prescriptive easement area, the use of the easement area is controlled by VDOT. Unlike easements by

express or implied grant, an easement by prescription may be extinguished; therefore, a dedicated HRSD easement is needed in this area to make sure HRSD has legal access to their facilities in the future.

Construction and maintenance/operation of the proposed pump stations will also require temporary construction easement, permanent easement, and parcel acquisition.

The following methodology was utilized to estimate the total cost of proposed easements/property acquisition required for the construction, operation and maintenance of the MISPPII project.

- Temporary construction easements and permanent easements were identified based on the proposed force main alignment, proposed pump station sites, Eastern Middlesex Regional Water System Project survey, Middlesex County GIS data and Mathews County GIS data.
- For each parcel where an easement was identified to be necessary, the total parcel area, property value, and parcel owner information were identified using publicly available Middlesex County GIS data and Mathews County GIS data. Based on the total land value and acreage the per square foot land value was established. For parcels with incomplete county GIS information, the land values were estimated using land values of adjacent parcels with similar land use.
- The per square foot land value of each property was then multiplied by the anticipated easement square footage on each property to estimate the easement/property acquisition cost for each parcel impacted. The following guidelines were used to calculate acquisition costs:
    - Land value estimate calculated based on assessed land value plus 20%
    - 10% of the land value was assumed for temporary construction easement, with an assumed temporary easement duration of 2 years.
    - 50% of the land value was assumed for permanent easements
    - 100% of land value was assumed for properties to be acquired for pump station sites

A total of 92 parcels are anticipated to be impacted based on the recommended alternatives presented in section 13. This total is based on assumption that easements will be needed along Twiggs Ferry Road between General Puller Highway and the Piankatank River bridge. Easements in this area may not be needed; however, this can't be determined until the design phase when property research is conduct with the survey effort. Table 9-1 includes the estimated easement acquisition and property acquisition costs based on the recommended alternatives presented in section 13. The easement requirements are broken into the needs for the three individual CIP projects HRSD has identified for the MISPPII improvements. Further discussion of the three CIP projects is included in section 10. Appendix K includes a detailed summary of impacted parcels and associated acquisition costs. Easement needs are shown on the preliminary force main plans included in Appendix C. Final easement and property acquisition requirements and costs will be determined during the design phase. It should be noted preliminary estimated easement acquisition costs only include land value and do not include costs associated with negotiating and acquiring easements or property.

Table 9-1: Preliminary Estimated Easement Acquisition and Parcel Acquisition Costs

CIP Project	Temporary Easement Cost	Permanent Easement Cost	Parcel Acquisition Cost	Total
MP013710 Middlesex Saluda Pump Station	-	-	$2,074	$2,074
MP013720 Hartfield Pump Station	$142	$7584	$11,387	$19,113
MP013730 Middlesex Transmission Force Main	$43,947	$184,399	$60,295	$288,582
Total Estimated Easement/Property Acquisition Cost				**$309,769**

10 Opinion of Probable Construction Costs & Program Funding

Based on discussion with HRSD the proposed MISPPII improvements will be broken into three separate CIP projects. The three CIP projects are listed in Table 10-1 with the descriptions of work anticipated to be included in each.

Table 10-1: MISPPII CIP Project Descriptions

CIP Project	Description of Work
MP013710 Middlesex Saluda Pump Station	• Central Middlesex Pump Station • Central Middlesex Treatment Plant decommissioning • Middlesex Interceptor Sewer Program Phase I force main extension to Central Middlesex PS
MP013720 Hartfield Pump Station	• Hartfield pump station • Branch force main connections from Middlesex transmission force main to Hartfield pump station
MP013730 Middlesex Transmission Force Main	• Middlesex transmission force main from Urbanna pump station to connection to Mathews transmission force main • Urbanna Pump Station • Urbanna Treatment Plant decommissioning • Locust Hill pump station • Cook's Corner pump station upgrades • County Line pump station upgrades • Beaver Dam pump station upgrades • New pump station in Mathews system between County Line pump station and Beaver dam pump station

An opinion of probable construction costs is presented in Table 10-2 for MP013710 Middlesex Saluda Pump Station, Table 10-3 for MP013720 Hartfield Pump Station, and Table 10-4 for MP013730 Middlesex Transmission Force Main. Costs are based on the published 20-city average ENR construction cost index of 11455, which is an average index for August 2020. The estimate at this phase in design is indicative of

an AACE International Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries Class 3. A Class 3 Estimate typically forms the initial control estimate against which all actual costs and resources will be monitored with engineering from 10% to 40% complete. The accuracy of this type of estimate can range from -10% to -20% on the low side, and +10% to +30% on the high side. Table 10-2 provides costs for the MISPPII project. Detailed opinions of probable construction costs are included in Appendix L.

Table 10-2: MP013710 Middlesex Saluda Pump Station Opinion of Probable Construction and Project Costs

Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Project Construction	-	$1,229,000	$1,536,000	$1,997,000
Construction Contingency	20%	$246,000	$307,000	$399,000
Project Construction		**$1,475,000**	**$1,843,000**	**$2,396,000**
*All values rounded to nearest $1,000				

Table 10-3: MP013720 Hartfield Pump Station Opinion of Probable Construction and Project Costs

Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Project Construction	-	$2,846,000	$3,557,000	$4,624,000
Construction Contingency	20%	$569,000	$711,000	$925,000
Project Construction		**$3,415,000**	**$4,268,000**	**$5,549,000**
*All values rounded to nearest $1,000				

Table 10-4: MP013730 Middlesex Transmission Force Main Opinion of Probable Construction and Project Costs

Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Pipeline Construction	-	$13,234,000	$16,542,000	$21,505,000
Pump Station Construction & Pump Station Improvements	-	$4,708,000	$5,885,000	$7,651,000
Total Construction	-	$17,942,000	$22,427,000	$29,155,000
Construction Contingency	20%	$3,588,000	$4,485,000	$5,831,000
Project Construction		**$21,530,000**	**$26,912,000**	**$34,986,000**
*All values rounded to nearest $1,000				

11 Sustainability Considerations

11.1 Background

HRSD is interested in implementing sustainability practices into the evaluation, design and construction of infrastructure projects. A preliminary Envision® sustainability assessment was completed for potential practices, materials, and equipment available for implementation or use at the facilities. This section includes a description of possible sustainability practices related to the project.

11.2 Rating System Consideration

The Institute for Sustainable Infrastructure Envision® Rating System assessment tool was completed for the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project. Like LEED credentialing for occupied structures, the Envision® system considers sustainable practices employed in all types of infrastructure projects including utility projects. The rating system consists of 64 sustainability credits divided into five sections: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Resilience. The tool assigns an award recognition level depending on the achievement ranging from a bronze award (20%) up to a platinum award (50%) of applicable points. Any user can complete the assessment tool online however, a fee based on the cost of the project is required to obtain third party validation and then, if applicable, an achievement award.

HRSD values implementation of sustainable practices with infrastructure improvement projects, but it is understood project certification is not anticipated. The Envision® Pre-Assessment Checklist for the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project is included in Appendix M. The pre-assessment checklist indicates the Envision® criteria that a specific project has the potential to implement sustainable practices in. It was completed to help identify aspects of the design where opportunities are present for sustainable practices to be implemented.

This project will implement sustainable practices by providing new force main, pump stations, equalization tanks, and decommissioning two WWTPs to provide reliable sewer infrastructure to new communities helping to stimulate economic growth while minimizing the social and environmental impacts of the improvements. The project will involve active engagement and coordination with many stakeholders to ensure the project supports theirs needs and goals while minimizing negative impacts. It is anticipated social impacts will be minimized by trenchless construction methods, detailed maintenance of traffic plans, maintaining accesses to business and residents, and limiting construction to standard working hours in residential areas. It is anticipated environmental impacts will be lessened by minimizing land disturbance, avoiding wetlands and wooded areas, eliminating two WWTP discharge points, and including proficient erosion and sediment control plans. It is anticipated these improvements will stimulate economic growth at the proposed connection points while eliminating the ongoing maintenance needed at the two WWTPs to be decommissioned.

The criteria identified where potential opportunities for sustainable design practices exists will be further evaluated during the Envision Workshop and design phase of the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project. Routine workshops to discuss implementation of sustainability measures throughout the design process are recommended to ensure sustainability functions are maximized while closely monitoring project schedules and budgets. Even if

the project is not validated or an achievement level is not attained, the Envision® assessment is an effective measure to ensure sustainability features are incorporated into a project at a sensible level.

11.3 Initial Assessment Summary

Evaluation using the Envision® assessment checklist results in a potential for a Silver award level. While several criteria are not applicable to the project, key sustainable elements arise out of providing reliable sewer infrastructure to new communities, resilient pump stations and equalization tanks, and decommissioning two WWTPs. A few examples are noted as follows:

- An assessment at the restorative level results for Improve Community Quality of Life within the Quality of Life category (26 of 26 available points) because of initiatives such as:
    - Providing connection points for areas of future development to stimulate economic growth
    - Eliminating two WWTP discharge points, improving water quality and lessening environmental impacts
    - Utilizing trenchless construction methods to minimize impacts to traffic and wooded areas
    - Ongoing coordination with project stakeholders to ensure those affected are satisfied the project addresses their needs and goals
- An assessment at the restorative level results for Protect Surface & Groundwater Quality within the Natural World category (20 of 20 available points) because the project documents will address spill and leak prevention, and the surface water quality in Urbanna Creek will be improved through the elimination of two WWTP discharge points.
- An assessment at the restorative level results for Improve Infrastructure Integration within the Climate and Resilience category (18 of 18 available points) because the improvements expand HRSD's existing system and provide reliable sewer infrastructure to new areas through proposed connection points. Additionally, the system's performance is increased by eliminating two WWTP discharge points while providing increased resilience through equalization tanks. Monitoring systems will be provided throughout the project (flow, pressure, etc.).

Other factors identified during the Envision® review to implement sustainable practices include:

- Improve construction safety with MOT and spill prevention plans
- Minimize construction impacts by maintaining accesses and avoiding historic resources
- Early and frequent stakeholder involvement
- Preserve site soils by limiting disturbance
- Provide long-term monitoring and maintenance of the facilities
- Evaluate risk and maximize resilience through new facilities
- Provide stormwater management measures at the pump station sites
- Preserve undeveloped land by aligning the force main within existing ROW

12 Project Risk Assessment and Mitigation

A summary of anticipated risks associated with the design and construction of this project as well as potential mitigation efforts is provided in Table 12-1.

Table 12-1: Project Risk Summary

Phase	Risk	Cause of Risk	Potential Consequence	Risk Mitigation
Design	Easement Acquisition/Property Acquisition not completed in time for construction	Unwilling property owners	Change in alignment/alternate pump station/tank site needed	Provide easement plats HRSD early to allow adequate time for acquisition/Provide HRSD with in-house support for acquisition assistance
Design	Delay in environmental permit(s) for river crossing	Governors approval required - duration of agency review and approvals vary	Delay in bidding/construction schedule	Identify means and methods for HDD construction early so this can be incorporated into the permit application.
Design	Delay in obtaining site plan approval from County	Limited in-house resources/availability to review plans	Schedule slippage	Meet with stakeholders/review agencies early to confirm expectations for submittal requirements and review overall project schedule
Design	Delay in obtaining VDOT Land Use Permit	Limited in-house resources/availability to review plans	Schedule slippage	Meet with stakeholders/review agencies early to confirm expectations for submittal requirements and review overall project schedule
Design/ Construction	Impacts to special events (i.e. Urbanna Oyster Festival)	Currently scheduled events	Impacts to parking areas for events/unhappy public	Work with county/Town during design phase to confirm event schedule and be transparent with respect to construction impacts, need for staging areas, etc.
Design/ Construction	Utility conflicts/damage to existing utilities	Inadequate utility records, not able to locate utilities in the field	Interruption in service, additional cost to repair utilities or relocate new pipeline	Perform utility research and locating during design so new force main is constructed in a location to avoid conflicts
Design/ Construction	Delays due to environmental restrictions (i.e. Northern Long Eared Bat, Anadromous Fish spawning/migration periods)	U.S./Federal Fish and Wildlife Regulations (i.e., Time of Year Restrictions for tree clearing)	Delay in construction schedule	Work with permitting agencies early to confirm any time of year restrictions so this information is communicated to construction team and construction schedule is adjusted accordingly. Eliminate any disturbance in the River/creek by directionally drilling the entire crossing.
Design/ Construction	Impacts to cultural/archaeological resources	Unforeseen conditions	Delay in construction schedule/need to relocate pipeline alignment	Propose/Perform Phase I cultural resources/archaeological survey as part of PER

Phase	Risk	Cause of Risk	Potential Consequence	Risk Mitigation
Design/ Construction	Delay in getting new electrical service to pump station sites	Dominion Energy - delay in processing work order requests	Slippage in construction schedule/not able to bring pump station on-line for startup and operation	Identify electrical requirements at 60% design stage. Submit load letter and generate work order request early. Coordinate with HRSD/Dominion early and often to ensure work is progressing. Also make sure that cost for extending/providing power to sites in included in overall project budget.
Construction	Escalation in material pricing	Market conditions (steel and HDPE)	Cost increase	Identify/confirm necessary materials early in design phase and adjust pricing at each estimate/submittal stage
Construction	Failed trenchless crossing(s)	Equipment failure, change in geotechnical conditions	Settlement of VDOT owned roads - additional restoration required	Follow HRSD trenchless checklist. Perform adequate soils investigations and locate casings at appropriate elevations based on geotechnical data
Construction	Frac-out during HDD crossing	Change in geotechnical conditions	Release in Creek/River or other environmentally sensitive areas	Prepare frac-out mitigation plan and have measures in place for cleaning up any releases. Utilize equipment to measure downhole pressures.
Construction	Failed HDD crossing	Equipment failure, change in geotechnical conditions, complexity of drill	Schedule slippage/additional cost	Develop contingency plan for different scenarios and have measures in place to act in accordance with plan if need arises
Construction	Noise and other impacts to neighboring properties	Construction equipment and activities	Complaints to HRSD and County	Notify residents of construction activities and limit nighttime work hours. Perform public outreach during design phase to highlight the short and long term benefits of the program through better water quality and smart growth.
Construction	Interruption in Treatment Plant Operations	Damage to existing utilities/power to existing treatment plant	DEQ Violations and fines	Perform due diligence/verify and respect Miss Utility markings and exercise care during construction when working around the existing treatment plant
Construction	Traffic impacts to neighborhoods and businesses	Construction equipment and activities	Complaints to HRSD and County	Coordinate with neighboring businesses and residents in advance to identify impacts

13 Conclusions and Recommendations

13.1 Force Main Alignment

The recommended force main alignment is shown on the preliminary plans included in Appendix C. The alignment was selected to account for future Middlesex County water and sewer system improvements, minimize impacts to traffic and the environment, and locate the pipeline in areas that can be easily accessed and maintained in the future. It should be noted that there is little flexibility for the alignments for the two waterway crossings/horizontal directional drills; therefore, HRSD should initiate negotiations with the property owners as soon as possible.

13.2 MISPPII Pump Stations and Equalization Storage Facilities

Recommendations for pump stations and equalization storage for this project include implementing the following:

- Central Middlesex Treatment Plant Pump Station – Alternative 1 (existing parking lot adjacent to treatment plant), a duplex submersible pump station with pumps discharging 50 gpm at up to 203 feet TDH to a 3-inch force main (3-inch force main being constructed as part of HRSD's Middlesex Interceptor Force Main Phase I – Cook's Corner (MP013600) project). This alternative was selected as it can be constructed without impacting the existing treatment plant operations and places the pump station in a more accessible location for vehicular access compared to where it would be if located at the existing treatment plant site.
- Urbanna Treatment Plant Pump Station – Alternative 4 (southwest corner of parcel adjacent to Tabor Park), a duplex submersible pump station with discharging 300 gpm at up to 216 feet TDH with no equalization storage facility. This alternative was selected because it will allow HRSD to eliminate the existing Bonner Street pump station, potentially eliminate the Tabor Lane pump station (see Gravity Sewer from Tabor Lane PS to Urbanna PS figure in appendix H) and minimizes impacts to the Town of Urbanna Tabor Park.
- Middlesex Pump Stations Alternative 3: Construct pump station at Hartfield and no pump station at interconnection of MISPPII force main and Mathews transmission force main
    - Construct new Locust Hill and Hartfield pump stations with equalization storage facilities at the locations shown on the preliminary plans included in Appendix C. Preliminary pump station plan views are included in Appendix H.
        - Locust Hill duplex submersible pump station with pumps discharging 300 gpm at 96 feet TDH. A total of 100,000 gallons of equalization storage at the site.
        - Hartfield dry pit submersible pump station with pumps in series discharging 300 gpm at 340 feet TDH. A total of 275,000 gallons of equalization storage at the site.
- Install new pumps and controls at Cook's Corner pump station to meet the new operating conditions (90 gpm at 138 feet TDH) once the new force main is placed into service.

An overview of the recommended MISPPII system is provided in Figure 13-1.

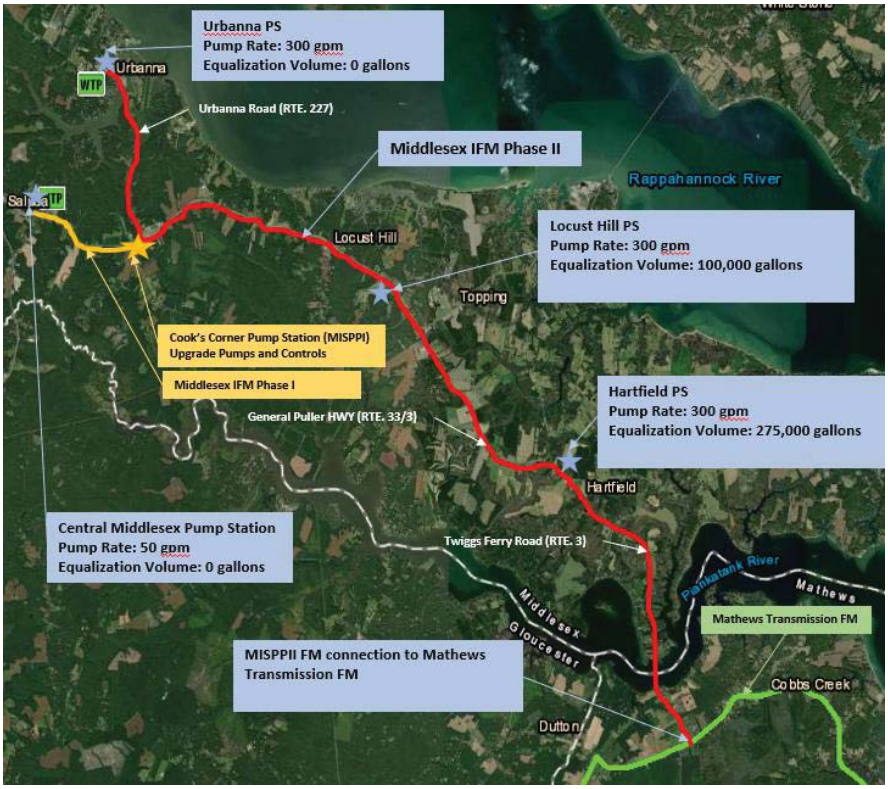


Figure 13-1: Middlesex Interceptor Sewer Program Phase II Improvements

13.3 Mathews System Improvements

Based on our evaluation, the existing Mathews system does not have the capacity to accommodate anticipated 2030 flows from the proposed Middlesex system. Pump upgrades are necessary at both the Mathews County Line and the Beaver Dam pump stations to convey projected flows from Mathews and Middlesex Counties and convey excess flows from wet weather. In order to reduce equalization requirements to accommodate wet weather events, capacity in the Mathews system downstream of the County Line pump station should be increased to 431 gpm. Increasing the capacity of the system to 431 gpm will accommodate the maximum anticipated flow rate being discharged into the County Line pump station when the Hartfield pump station is operating at 300 gpm and Buckley Hall pump station is operating at 131 gpm (the calculated discharge rate with no pump improvements and Hartfield pump station operating). The following improvements are anticipated to be required to accommodate increased capacity in the Mathews system downstream of the connection of the MISPPII force main.

- Install new pumps and controls at County Line pump station and Beaver Dam pump station to meet new operating conditions required to increase Mathews system capacity to 431 gpm.
    - County Line pump station operating point: 431 gpm at 417 feet TDH
    - Beaver Dam pump station operating point: 431 gpm at 214 feet TDH
- Construct new pump station in Gloucester County half-way between County Line pump station and Beaver Dam pump station with operating point: 431 gpm at 417 feet of TDH.

Figure 13-2: Middlesex Interceptor Sewer Program Phase II Improvements

13.4 CIP Projects Construction Contracting, Construction Sequence and Project Schedule

Based on discussion with HRSD the proposed MISPPII improvements will be broken into three separate CIP projects. The three CIP projects are listed in Table 10-1 with the descriptions of work anticipated to be included as part each CIP project.

It is anticipated the three projects will be executed through three separate construction contracts. Based on the scope of work, it is recommended that the MP013730 Middlesex Transmission Force Main project be executed through two construction contracts – one for the linear pipeline work and one for the pump stations/treatment plant decommissioning. It is recommended that the MP013710 Middlesex Saluda Pump Station and MP013720 Hartfield Pump Station be executed as single construction contracts for each CIP project.

In general, the construction shall be sequenced as follows:

- Construct and commission new Middlesex force main between Urbanna and the connection point to the existing Mathews system
- Construct Mathews system improvements including the following:
    - Pump and control upgrades at County Line pump station and Beaver Dam pump station
    - Construct and commission new pump station between County Line pump station and Beaver Dam pump station

- Construct new Locust Hill and Hartfield pump stations/equalization facilities and commission pump stations starting at the most downstream pump station. Note: assumes modifications to Mathews system have been implemented.
- Construct and commission new Urbanna pump station. This includes construction of improvements to divert flows from the Bethpage Campground to the new Urbanna pump station.
- Complete upgrades/modifications to Cook's Corner pump station so flows can be discharged into the new Middlesex force main
- Construct Central Middlesex pump station and remaining portions of Central Middlesex force main. Commission new pump station which will re-direct flows to the Cook's Corner pump station.
- After demonstration period, decommission existing Urbanna and Central Middlesex treatment plants

A proposed schedule for the design and construction of the project assuming an early February 2020 notice to proceed for the design effort is included in Appendix N. A summary of major milestones is provided in Table 13-1.

Table 13-1: Project Schedule Summary

Project Milestone	Anticipated Date
Notice to Proceed (Design)	February 2021
50% Progress Submittal	June 2021
Easement Plats to HRSD	September 2021
90% Progress Submittal	October 2021
Bid Ready Documents	January 2022
Bid/Award Phase- MP013720 & MP013730	January 2022 – February 2022
Construction Phase - MP013720 & MP013730	April 2022 – June 2024
Bid/Award Phase- MP013710	May 2022 – July 2022
Construction Phase - MP013710	August 2022 – October 2024

13.5 Program Costs

A summary of costs to design and construct each of the three CIP projects included in the MISPPII improvements is provided in Table 13-2,

Table 13-3, and Table 13-4. A summary of total costs associated with the three CIP projects anticipated as part of the MISPPII improvements is provided in Table 13-5. The CIP project estimate from HRSD's Middle Peninsula Treatment Plant Service Area CIP is included in Table 13-5.

Table 13-2: MP013710 Middlesex Saluda Pump Station Capital Budget Summary

Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Project Construction	-	$1,229,000	$1,536,000	$1,997,000
Construction Contingency	20%	$246,000	$307,000	$399,000
Project Construction		**$1,475,000**	**$1,843,000**	**$2,396,000**
Easement Acquisition**	Estimate	$2,000	$2,000	$2,000
Preliminary Engineering	-	-	-	-
Engineering Design	10%	$148,000	$184,000	$240,000
Pre-Construction/Bid Phase Services	0.15%	$2,000	$3,000	$4,000
Construction Administration	1.5%	$22,000	$28,000	$36,000
Construction Inspection	10%	$148,000	$184,000	$240,000
Estimated Program Cost		**$1,797,000**	**$2,244,000**	**$2,918,000**

*All values rounded to nearest $1,000
**Easement acquisition cost estimates only include land value and do not include costs associated with negotiating and acquiring easements/property

Table 13-3: MP013720 Hartfield Pump Station Capital Budget Summary

Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Project Construction	-	$2,846,000	$3,557,000	$4,624,000
Construction Contingency	20%	$569,000	$711,000	$925,000
Project Construction		**$3,415,000**	**$4,268,000**	**$5,549,000**
Easement Acquisition**	Estimate	$19,000	$19,000	$19,000
Preliminary Engineering	-	-	-	-
Engineering Design	10%	$342,000	$427,000	$555,000
Pre-Construction/Bid Phase Services	0.15%	$5,000	$6,000	$8,000
Construction Administration	1.5%	$51,000	$64,000	$83,000
Construction Inspection	10%	$342,000	$427,000	$555,000
Estimated Program Cost		**$4,174,000**	**$5,211,000**	**$6,769,000**

*All values rounded to nearest $1,000
**Easement acquisition cost estimates only include land value and do not include costs associated with negotiating and acquiring easements/property

Table 13-4: MP013730 Middlesex Transmission Force Main Capital Budget Summary

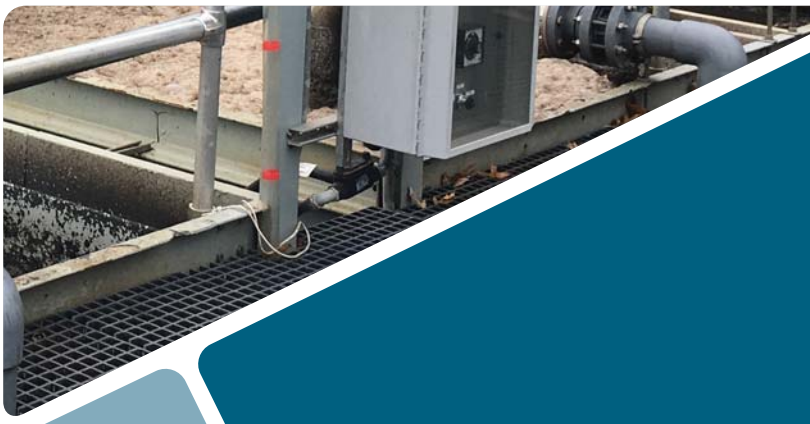
Description	% of Construction	AACE Class 3 Estimate Range		
		Low (-20%)	Base Estimate	High (+30%)
Project Construction	-	$17,942,000	$22,427,000	$29,155,000
Construction Contingency	20%	$3,588,000	$4,485,000	$5,831,000
Project Construction		**$21,530,000**	**$26,912,000**	**$34,986,000**
Easement Acquisition**	Estimate	$289,000	$289,000	$289,000
Preliminary Engineering	Actual Cost	$448,000	$448,000	$448,000
Engineering Design	10%	$2,153,000	$2,691,000	$3,499,000
Pre-Construction/Bid Phase Services	0.15%	$32,000	$40,000	$52,000
Construction Administration	1.5%	$323,000	$404,000	$525,000
Construction Inspection	10%	$2,153,000	$2,691,000	$3,499,000
Estimated Program Cost		**$26,928,000**	**$33,475,000**	**$43,298,000**

*All values rounded to nearest $1,000
**Easement acquisition cost estimates only include land value and do not include costs associated with negotiating and acquiring easements/property

Table 13-5: Middlesex Interceptor Program Phase II Capital Budget Summary

Description	CIP Estimate	% of Construction	AACE Class 3 Estimate Range		
			Low (-20%)	Base Estimate	High (+30%)
Project Construction	$24,041,000	-	$22,017,000	$27,520,000	$35,776,000
Construction Contingency	$4,452,000	20%	$4,403,000	$5,503,000	$7,155,000
Project Construction	**$28,493,000**		$26,420,000	$33,023,000	$42,931,000
Easement Acquisition	-	Estimate	$310,000	$310,000	$310,000
Preliminary Engineering	$688,000	Actual Cost	$448,000	$448,000	$448,000
Engineering Design	$1,781,000	10%	$2,643,000	$3,302,000	$4,294,000
Pre-Construction/Bid Phase Services	$25,000	0.15%	$39,000	$49,000	$64,000
Construction Administration	-	1.5%	$396,000	$496,000	$644,000
Construction Inspection	-	10%	$2,643,000	$3,302,000	$4,294,000
Estimated Program Cost	**$30,992,000****		$32,899,000	$40,930,000	$52,985,000

*All values rounded to nearest $1,000
**CIP Project Cost includes additional $25,000 close out cost not shown in table
***Easement acquisition cost estimates only include land value and do not include costs associated with negotiating and acquiring easements/property



Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main Preliminary Engineering Report Appendices

Appendix A:	Preliminary Cultural Resources Assessment for the HRSD Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main (May 2020)
Appendix B:	Joint Permit Application – Fiber Optic Cable Installation/Piankatank River Crossing
Appendix C:	Preliminary Force Main Plans
Appendix D:	Middlesex Interceptor Subaqueous HDD Feasibility Study
Appendix E:	Cyclical Loading Analysis of PVC Pipeline
Appendix F:	Flow Projections
Appendix G:	HRSD-Urbanna to Mathews Transmission Force Main Preliminary Flow Projections and Mathews Capacity Analysis Memorandum
Appendix H:	Pump Station Layouts & Gravity Sewer Service Area Exhibits
Appendix I:	Environmental Database Resource Report
Appendix J:	Wetlands, Resource Protection Areas, and Threatened & Endangered Species Data
Appendix K:	Anticipated Easements & Property Acquisition Tables
Appendix L:	Detailed Opinions of Probable Construction Costs
Appendix M:	Envision® Pre-Assessment Checklist
Appendix N:	Project Schedule

Appendix A: Preliminary Cultural Resources Assessment for the HRSD Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main (May 2020)

PRELIMINARY CULTURAL RESOURCES ASSESSMENT FOR THE HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II—URBANNA TO MATHEWS TRANSMISSION TFM MIDDLESEX AND MATHEWS COUNTIES, VIRGINIA

May 2020

Prepared For:

Kimley-Horn
4525 Main Street, Suite 1000
Virginia Beach, Virginia 23452

Prepared By:

Matthew R. Laird, Ph.D., RPA
James River Institute for Archaeology, Inc.
223 McLaws Circle, Suite 1
Williamsburg, Virginia 23185
(757) 229-9485

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

The Hampton Roads Sanitation District (HRSD) is planning to undertake the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project in Middlesex and Mathews counties, Virginia. The project will involve the construction of a 3.2-mile force main from Urbanna to Cooks Corner via State Route 227 (Urbanna Road), and a 13-mile force main along State Route 33 (General Puller Highway) and State Route 3 (Twiggs Ferry Road) from Cooks Corner to the existing Mathews Transmission Force Main in Mathews County (Figures 1-5). The new Middlesex transmission force main (TFM) will convey wastewater from Middlesex County to the York River Treatment Plant and enable decommissioning of both the Urbanna Treatment Plant and the Central Middlesex Treatment Plant in Saluda. The project will also include the construction of new pump stations at the Urbanna Treatment Plant, Central Middlesex Treatment Plant, and Cooks Corner, and potentially two additional booster stations along the TFM. Finally, the project will also require horizontal directional drilling (HDD) under Urbanna Creek and the Piankatank River.

This preliminary cultural resource assessment prepared by the James River Institute for Archaeology, Inc. (JRIA) is intended to assist in planning for potential cultural resource investigations which may be required for the project under Section 106 of the National Historic Preservation Act. It includes a prehistoric and historic context of the overall project area; an analysis of the earliest available detailed historic mapping; a summary of all previously recorded cultural resources (including historic districts, standing structures, and archaeological sites) within or in the immediate vicinity of the proposed area of potential effect (APE) for the project; and recommendations concerning those areas with the highest potential for significant, intact archaeological resources.

In 1991, the William and Mary Center for Archaeological Research (WMCAR) completed a Phase I cultural resources survey of the proposed Route 33 project in Middlesex County (Gallucci et al. 1992). This project, which was conducted on behalf of the Virginia Department of Transportation (VDOT), was designed to identify and evaluate all cultural resources which would be affected by the proposed widening of a 5.3-mile section of Route 33 between Cooks Corner and Harmony Village. No new archaeological sites were identified in the course of this investigation, and two existing archaeological sites (44MX0012 and 44MX0013) were determined to be not eligible for listing in the National Register of Historic Places (National Register). It was determined that the project would have no direct effect on Christ Church (Virginia Department of Historic Resources [DHR] ID# 059-0002). However, four historic properties were determined to be potentially eligible for listing in the National Register, and were further evaluated at the Phase II level. Marsh Pungo (DHR ID# 059-0012), First Baptist Church (DHR ID# 059-0035), and Rappahannock High School (DHR ID# 059-0051) were determined to be not eligible, while the Walker House (DHR ID# 059-0063) was determined eligible.

Because the proposed Middlesex TFM will be constructed within the existing VDOT right-of-way, JRIA has not included the 5.3-mile section between Cooks Corner and Harmony Village previously investigated by WMCAR in this study.

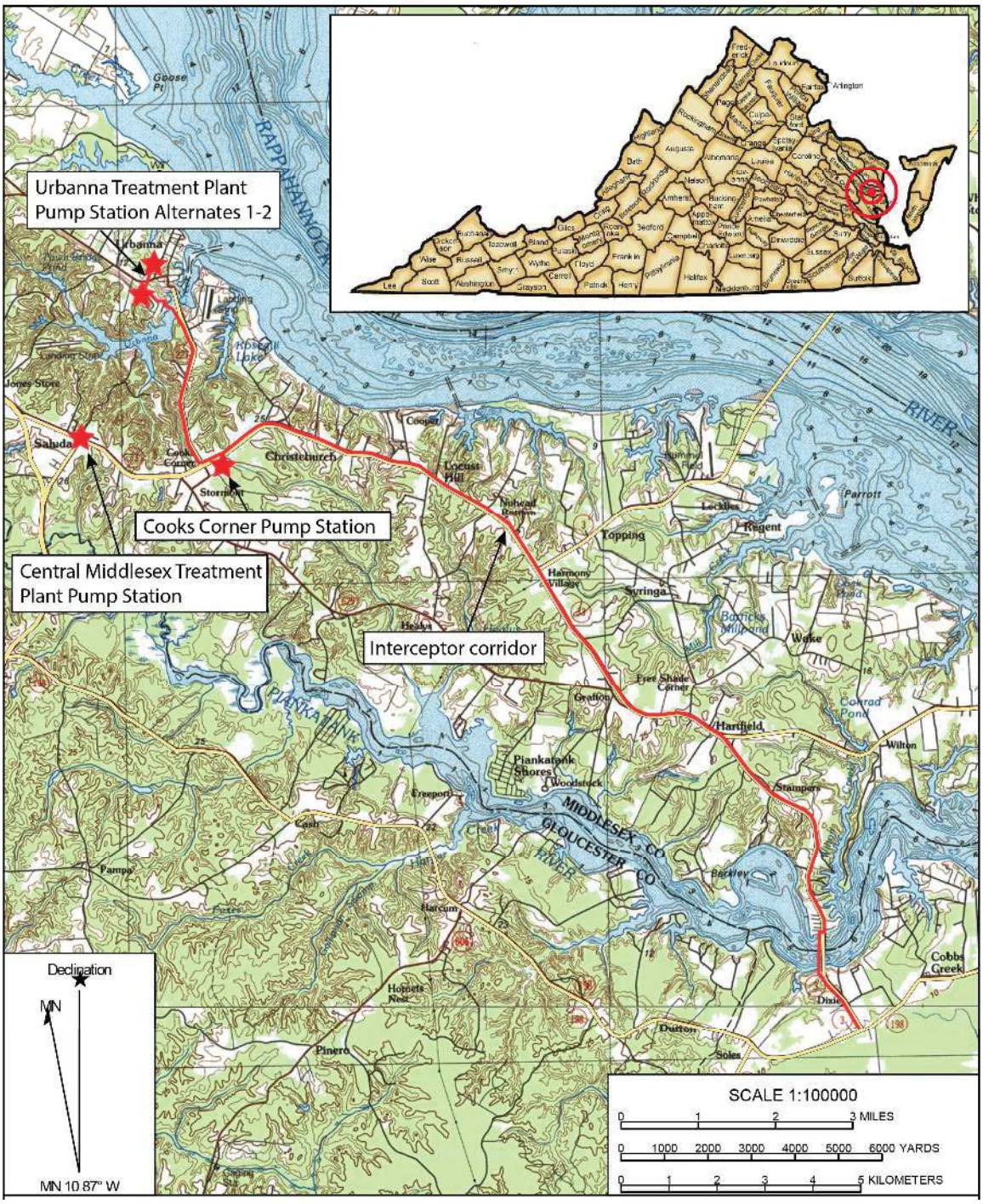


Figure 1. Location of the project corridor on detail of U.S.G.S. 1:100,000 Tappahannock (1984) and Williamsburg (1984) topographic quadrangle maps.

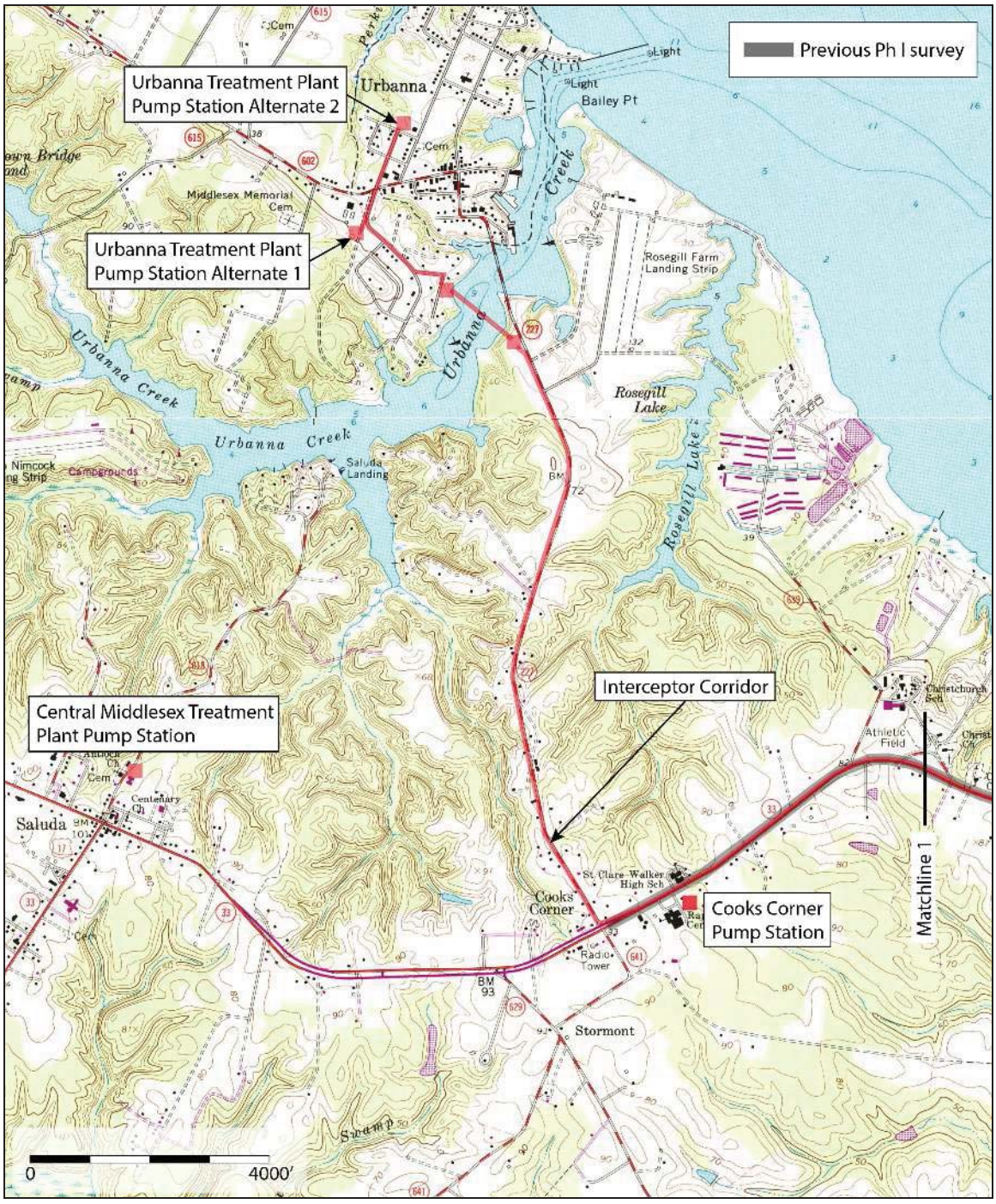


Figure 2. Location of the project area on detail of U.S.G.S. 7.5' Urbanna (1978) and Saluda (1986) topographic quadrangle maps.

Figure 3. Location of the project area on detail of U.S.G.S. 7.5' Urbanna (1978), Saluda (1986), and Wilton (1992) topographic quadrangle maps.

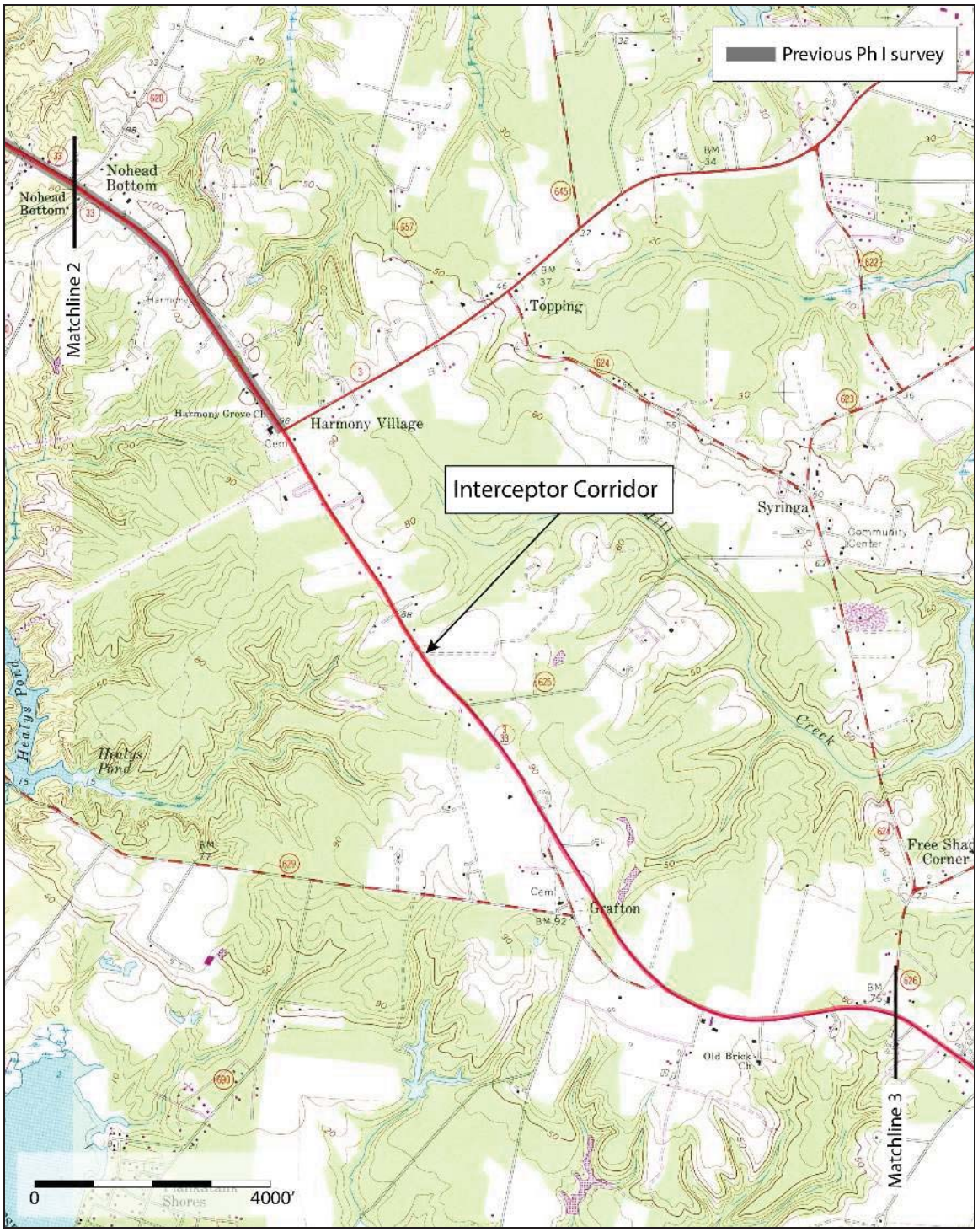


Figure 4. Location of the project area on detail of U.S.G.S. 7.5' Saluda (1986) and Wilton (1992) topographic quadrangle maps.

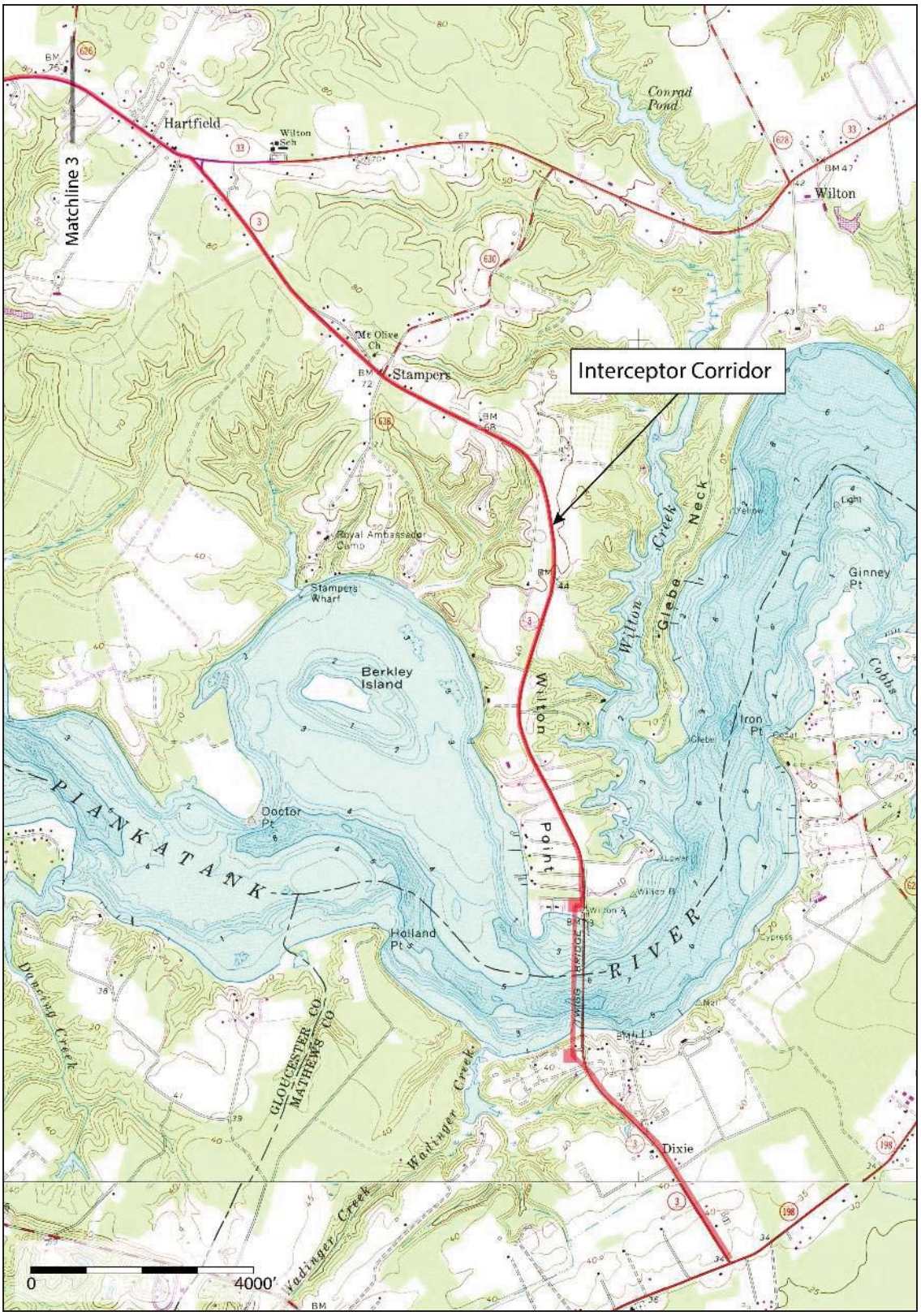


Figure 5. Location of the project area on detail of U.S.G.S. 7.5' Wilton (1992) and Ware Neck (1980) topographic quadrangle maps.

II. CULTURAL CONTEXT

PREHISTORIC CONTEXT

Virginia's prehistoric cultural chronology is subdivided into three major time periods based on changes in subsistence as exhibited by material remains and settlement patterns. These divisions are known as the Paleoindian, Archaic, and Woodland periods. A brief summary of the regional cultural chronology follows, with comments on manifestations of each period within the project area vicinity.

Paleoindian (Prior to 10,000 B.C.)

Paleoindian occupation in Virginia, the first human occupation of the region, began some time before 10,000 B.C. The earliest recognized diagnostic artifacts Clovis projectile points, typically fashioned of high-quality cryptocrystalline materials such as chert, chalcedony, and jasper. Later Paleoindian points include smaller Clovis-like and Cumberland variants, small "Mid-Paleo" points, and, at the end of the period, Dalton, Hardaway-Dalton and Hardaway Side-notched points. Also diagnostic, though to a lesser extent, are certain types of well-made endscrapers, sidescrapers, and other formalized tools. Most current views now hold that eastern Paleoindians were generalized foragers with an emphasis on hunting. Social organization apparently consisted of relatively small bands that exploited a wide, but defined, territory (Gardner 1989: 5-52; Turner 1989: 71-94).

The majority of Paleoindian remains in Virginia are represented by isolated projectile point finds and what appear to be small temporary camps. Although some larger and very notable base camps are present in the state, they are relatively rare and usually associated with sources of preferred, high quality, lithic materials. The most important Paleoindian sites in Virginia, and in the eastern U. S. as a whole, are the Thunderbird Site in the Shenandoah Valley (Gardner 1974, 1977), the Williamson Site in south-central Virginia (McCary 1951, 1975, 1983), and the Cactus Hill Site in Sussex County. Both the Thunderbird and Williamson sites are large base camps associated with local sources of high-grade cryptocrystalline lithic materials. At the Thunderbird site area and its surrounding environs, a site typology has been formulated which includes lithic quarries, quarry-related base camps, quarry reduction stations, base camp maintenance stations, outlying hunting sites, and isolated point sites (Gardner 1981, 1989). Cactus Hill (44SX202), located on the Nottoway River near Stony Creek, is characterized by stratified deposits associated with the Paleoindian through Woodland periods. The site has yielded numerous Clovis projectile points, and generated a radiocarbon date of 15,070 B.P. from a pre-Clovis occupation layer, which is characterized by artifacts in a pre-Clovis core blade tradition (McAvoy and McAvoy 1997)

Archaic (8000-1200 B.C.)

The beginning of the Archaic Period generally coincided with the end of the Pleistocene epoch, marked in the region by a climatic shift from a moist, cool period to a warmer, drier climate. Vegetation also changed at this time from a largely boreal forest setting to a mixed conifer-deciduous forest. In eastern Virginia, a temperate climate was established, and the formation of the Chesapeake estuary began. Increasing differences in seasonal availability of resources brought on by post-Pleistocene changes are thought to have coincided with increasing emphasis on strategies of seasonally geared mobility (Dent 1995:147).

Archaic populations likely were characterized by a band-level social organization involving seasonal movements corresponding to the seasonal availability of resources and, in some instances, shorter-interval movements. Settlement during this era probably involved the occupation of relatively large regions by single band-sized groups living in base camps during part of the year, and dispersing as necessary on seasonal basis, creating smaller microband camps that may have consisted of groups as small as single families. The Archaic period saw the development of more specialized resource procurement activities and associated technologies. These differences in material culture are believed to reflect larger, more localized populations, as well as changes in food procurement and processing methods. The Archaic Period also marked the beginning of ground stone technology, with the occurrence of ground atlatl weights and celts. New tool categories that developed during the Archaic include chipped and ground stone celts, ground stone net sinkers, pestles, pecked stones, mullers, axes, and, during the more recent end of the Late Archaic, vessels carved from soapstone quarried in the Piedmont (Custer 1990: 35-40; Geier 1990: 84-86, 93-94).

Early Archaic

Corner and side-notching became a common characteristic of projectile points at the beginning of the Archaic Period (Early Archaic), indicating changes in hafting technology and possibly the invention of the spear-thrower (atlatl). Notched point forms include Palmer and Kirk Corner-notched and, in localized areas, various side-notched types. The later end of the Early Archaic Period and the beginning of the Middle Archaic Period are marked by a series of bifurcate base projectile point forms that, in this area, are mainly represented by Lecroy points.

Middle Archaic

As a whole, the Middle Archaic ca. 6500 - ca. 3000 BC, witnessed the rise of various stemmed projectile point forms, and there is a notable increase in the number of early Middle Archaic components over the immediately preceding Early Archaic. In this area of central Virginia, the most common Middle Archaic artifact forms are, from oldest to youngest, Lecroy, Stanly, Morrow Mountain, and Guilford projectile point types, followed by the side-notched Halifax type at the end of the period as it transitions into the Late Archaic between ca. 3500 and 3000 B.C. The numbers of Middle Archaic sites recorded in eastern Virginia as a whole indicate population increase at this time.

Late Archaic

The Late Archaic Period (ca. 3000-1200 B.C.) was dominated by stemmed and notched knife and spear point forms, including various large, broad-bladed stemmed knives and projectile points that generally diminish in size by the succeeding Early Woodland period (e.g., Savannah River points and variants). Also found, though less common, are stemmed and notched-stem forms identical to those associated more prominently with areas of Pennsylvania and adjoining parts of the northeast (Susquehanna and Perkiomen points).

Marked increases in population density and, in some areas, decreased mobility characterized the Late Archaic Period in the Middle Atlantic states and eastern North America as a whole. Locally, there is an increase in the numbers of late Middle Archaic (Halifax) and Late Archaic (Savannah River) sites over those of earlier periods, suggesting a population increase and/or intensity of use of this region between about 3500 B.C. and ca. 1200 B.C.

Agriculture in the Middle Atlantic region probably has its origins during this period. Yarnell (1976: 268), for example, writes that sunflower, sumpweed, and possibly goosefoot may have been cultivated as early as 2000 BC. In the lower Little Tennessee River Valley, remains of squash have been found in Late Archaic Savannah River contexts (ca. 2400 BC), with both squash and gourd in slightly later Iddins period contexts (Chapman and Shea 1981: 70). However, no cultigens have been found in Late Archaic contexts locally.

Woodland (1200 B.C. – ca. A.D. 1600)

The Woodland Period was characterized by the introduction of ceramic technology, a gradually developing dependence on horticulture, and increased sedentism. Three sub-periods (Early, Middle, and Late Woodland) have been designated, based primarily on stylistic and technological changes in ceramic and projectile point types, as well as settlement patterns.

Early Woodland

The Early Woodland Period, ca. 1200-500 B.C., is generally defined by the appearance of ceramics in the archaeological record. The earliest Woodland ceramic wares, Marcey Creek Plain and variants, are rectangular or oval and resemble the preceding Late Archaic soapstone vessels. These ceramics are followed by cord-marked, soapstone-tempered Selden Island ceramics, then by sand-and-grit-tempered Elk Island (Accokeek) ceramics with both plain and cord-marked surfaces. The latter traditionally were referred to as the Stony Creek series, although this type is now known to subsume several Early, Middle, and Late Woodland ceramic wares (Egloff 1991: 243-48).

Early Woodland sites in this section of Tidewater Virginia typically consist of small camps in both riverine and lesser-order stream locations, particularly those also occupied in the earlier part of the Middle Woodland period.

Middle Woodland

The Middle Woodland Period in this area, ca. 500 B.C. and A.D. 900, was marked by the appearance of net-marked, sand-tempered, and pebble-tempered pottery that generally spans the period ca. 500 B.C. to about A.D. 300 (Pope's Creek and Prince George wares). These ware types were supplanted by shell-tempered net- and cord-marked Mockley pottery until about A.D. 900 in areas lying east of the Fall Line. Local wares, such as Varina net-marked, were quite common in the Inner Coastal Plain, and have been dated to ca. A.D. 200/250 (Egloff 1991: 243-48).

Previous archaeological studies in the region have demonstrated the intensive use of small tributary streams as well as major river floodplains throughout the Middle Woodland period (ca. 500 B.C. and A.D. 900). Archaeologists have suggested that the Middle Woodland was characterized by "restricted wandering," in which groups used various campsites for several weeks at a time, obtaining needed materials in the site vicinity (Stewart 1992: 12-16).

Late Woodland

By the Late Woodland Period (A.D. 900-1600), agriculture had assumed a role of major importance in the prehistoric subsistence system. The adoption of agriculture represented a major change in the subsistence economy and patterns of settlement. The availability of large areas of arable land became a dominant factor in settlement location, and sites increasingly were located on fertile floodplain soils or on higher terraces or ridges adjacent to them.

Diagnostic artifacts of this period include several triangular projectile point styles that originated during the latter part of the Middle Woodland Period and decreased in size through time. Late Woodland ceramics from about A.D. 900 to the time of European contact in Tidewater Virginia include shell-tempered, Townsend, and Roanoke ceramics; untyped, sand-tempered, fabric-impressed ceramics that are otherwise similar to Townsend; and lithic- and sand-tempered simple-stamped ceramics similar to Gaston and Cashie types of North Carolina.

Although settlements dating to this time include some small camps, a large number of villages and small hamlets appear to have been occupied on a more permanent basis than those of older settlements are present. Some villages were highly nucleated while others were internally dispersed over a wide area. A number of villages were completely fortified by circular or oval palisades, indicating a rise in inter-group conflict, while others contained both a fortified core area and outlying houses. The more dispersed settlements were scattered over a wide area and characterized by fluid settlements within large, sprawling, and loosely defined town or village territories (Turner 1992: 108-114).

Drawings and journals of early European explorers describing Indian villages indicate that houses were constructed of oval, rectanguloid, or circular frameworks of flexible, green sapling poles set in the ground, lashed together, and covered with thatch or bark mats. Burial sites of the period were situated in individual pits or in ossuaries. Such

historical accounts are consistent with data obtained from archaeological excavations of Coastal Plain Late Woodland village sites (Hodges and Hodges 1994).

With the development of a more sedentary settlement-subsistence system culminating in the Late Woodland period, permanent habitation sites gradually replaced base camp habitation sites more characteristic of those of previous foragers and hunter-gatherers. Various supporting camps and activity areas were established in the day-to-day procurement of food and other resources (i.e., short-term hunting and foraging camps, quarries, butchering locations, and re-tooling locations). Locations used partially or largely for ceremonial purposes were also present, usually in association with habitation sites. Late Woodland hamlets and villages typically are found on bluffs, terraces, or floodplains adjacent to rivers or major tributaries. Small seasonal camps and non-seasonally based satellite camps supporting nearby sedentary villages and hamlets are located along smaller streams in the interior. These campsites typically are characterized by limited concentrations and sparse scatters of lithics and ceramics (Turner 1992: 108-114).

When John Smith and his fellow English explorers arrived in Tidewater Virginia in the spring of 1607, they stumbled into the territory of the powerful Powhatan Confederacy, one of the most well-organized and populous chiefdoms in the mid-Atlantic region. In his map depicting the location of Native American settlements, it is clear that the settlement in the Rappahannock valley was concentrated on the north bank of the river. However, Smith noted the location of the village of Opiscopank (variously known as Opiscatumek) on the south side of the Rappahannock, east of the mouth of Urbanna Creek (Figure 6). when he mapped it in 1608, he indicated that Opiscopank was the residence of a chief. However, he did not mention it in his narratives, and so it has become known as "John Smith's mystery village." English settlers did not begin taking up land in this area until the 1640s; but when they did, they recorded the presence of former Native American settlements in this vicinity. In 1649, when Ralph Wormeley patented the land that would become Rosegill plantation, the grant noted that his acreage on the east side of what is now Urbanna Creek included the "Indian Townes of old & new Nimcock." Archaeological investigations at Rosegill have identified evidence of Native American settlement dating to the Late Woodland and Contact periods, suggesting that this was the location of the Opiscopank/Nimcock villages (Nugent 1992: 181; DHR 2010).

Figure 6. Location of the project corridor on detail of *Virginia Discovered and Discribed* [sic.] (Smith 1624).

HISTORIC CONTEXT

Settlement to Society (1607-1750)

The land on the south shore of the Rappahannock River remained essentially off-limits to English settlement until the late 1640s. With its prime agricultural lands and convenient access to shipping, however, it was only a matter of time before wealthy landowners began taking up large riverfront tracts and establishing tobacco plantations in this area. The foremost of these was Ralph Wormeley, who patented 3,200 acres east of what is now Urbanna Creek in 1649 and established Rosegill plantation. Within 20 years, the population of this area had grown to the extent that Middlesex County was created from Lancaster County in 1669 (Rutman and Rutman 1984: 46; Gray et al. 1978: 43-44). When he sketched the extent of settlement in Tidewater Virginia in 1670, Augustine Herrman indicated that settlement in Middlesex County was strung out along the Rappahannock River, the primary artery of transportation, communication, and commerce (Figure 7).

In the Rappahannock River valley, and throughout the Chesapeake, it was tobacco, above all, which shaped nearly every aspect of life in the colonial period, encompassing the economy, the cultural landscape, and social relations. By the middle of the seventeenth century, tobacco cultivation formed the principal economic activity of every rank, from the largest landowner to the humblest tenant farmer. And once the system of tobacco monoculture had been established, it was nearly impossible to break free. Though prices for the crop in Europe fluctuated, often drastically, most planters preferred to stick with the staple, rather than risk an expensive investment of time and money in a less reliable export, such as grain (Kulikoff 1986: 4-5; Rutman and Rutman 1984: 41-43).

Much of the territorial conflict in seventeenth-century Virginia can be traced to the fact that the same prime agricultural lands which had supported Native American agricultural settlements for generations now proved equally attractive to Anglo-Virginian planters bent on profiting from tobacco. The location of seventeenth-century English tobacco plantations depended on three primary considerations: proximity to major water routes for ease of transportation; the availability of freshwater springs for drinking water; and good silty or sandy loams for growing tobacco. Because these considerations were identical to those of the resident Late Woodland peoples, there was a strong correlation between the sites of Late Woodland Algonquian villages and seventeenth-century English settlements. The labor-intensive nature of tobacco cultivation limited crops to approximately three acres per person. A perennial shortage of laborers and draft animals made traditional plowing impractical, so tobacco planters adopted Native American methods of hoe agriculture, planting their tobacco and corn around the stumps of newly cleared land. Likewise, the English soon realized the relative infertility of abandoned Indian fields, building their houses in these vegetation-free areas while using the adjoining former village locations for planting (Norris 1983: 27; Potter 1993: 220-21).

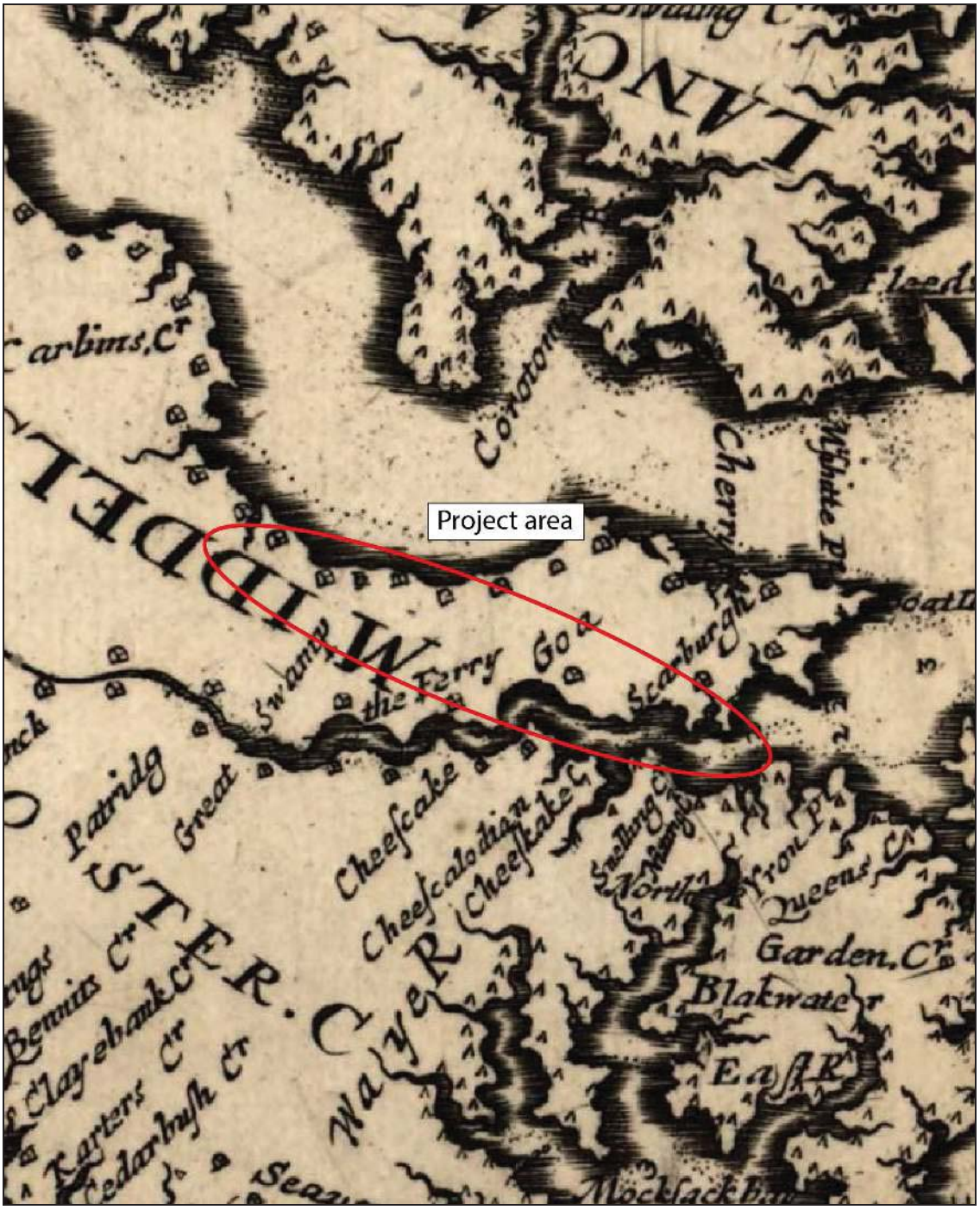


Figure 7. Location of the project corridor on detail of Virginia and Maryland as it is Planted and Inhabited This Present Year 1670 (Herrman 1673).

In his quantitative study of settlement patterns in colonial James City and York counties, Craig Lukezic discovered that soil type, more than any other consideration, determined where Chesapeake tobacco planters chose to live. Since tobacco was overwhelmingly important as a staple crop, Lukezic hypothesized, it should follow that planters would choose to settle on lands most conducive to growing this crop. When he examined statistically the relative importance of a variety of environmental factors in site selection, including soils, access to drinking water, proximity of navigable waterways, and distance from the nearest neighbor, Lukezic discovered that soil type was the most significant locational factor affecting colonial settlement (Lukezic 1990).

Tobacco plants grow best in gently sloped (2-6 percent), well-drained, loosely-structured soils such as light sand or sandy loam. The taste of the tobacco is also strongly influenced by soils, with the best flavor imparted by those with siliceous parentage. Though soil type is critical to the success of tobacco cultivation, topography is also an important consideration. Since tobacco plants will not mature properly if the roots are deprived of oxygen (e.g. by flooding), gently sloping soils in the range of 2-6 percent provide the ideal drainage for healthy plants. Thus, the primary considerations in defining areas of archaeological sensitivity for colonial sites were soil type and slope, with an emphasis on well-drained soils with slopes of 10 percent or less. The probability of locating colonial period resources diminishes accordingly on soil types and slopes less conducive to growing tobacco (Lukezic 1990).

Gaining access to productive tobacco lands was only the first step, however. Maintaining an adequate pool of labor proved more problematic to planters during the colonial era. Without breaking entirely away from tobacco, the only way to combat a decline in prices was to increase production. Greater yields required more plants, and more plants needed the attention of more laborers. Planters had relied for decades on a steady stream of white indentured servants willing to trade seven years of their lives for passage to the colonies, and the chance ultimately to become planters themselves. Beginning in the 1680s, however, the number of white servants arriving in Virginia was declining acutely. Desperate for workers, planters turned reluctantly to a new source: African slaves. In Middlesex County, enslaved Africans came to exceed white servants at some point between 1687, when blacks comprised only 8 percent of the total population, and 1699, when they accounted for 22 percent. The implications of Tidewater's darkening complexion would be profound (Kulikoff 1986: 4-6; Rutman and Rutman 1984: 41-43, 165-66).

The transition from white to black labor throughout Tidewater Virginia coincided with a lengthy period of economic instability. From the 1680s through the 1720s, Virginia suffered through a prolonged depression in the tobacco market. During this period, tobacco prices exceeded the costs of production in only one year out of five. To compound the problem, European wars regularly interrupted transatlantic trade. Chesapeake planters of all ranks responded by becoming more self-sufficient. Many shifted their focus from tobacco to other subsistence crops, such as wheat and corn; they also began to make their own cloth and consume a variety of local products. Released from the tyranny of tobacco, Virginians now had more time on their hands. More time allowed for increasing craft specialization, which in turn fed the growing demand for local products. As a result, Virginians were significantly more self-sufficient in 1750

than they had been at the turn of the eighteenth century (Kulikoff 1986:5; Carr and Walsh 1994).

In addition to its distinctive architectural forms, Tidewater Virginia's particular geography and economy resulted in a unique pattern of settlement that would persist well beyond the colonial period. The overwhelming dependence on tobacco monoculture, combined with the relative ease of waterborne transportation along the region's vast network of navigable rivers and streams, resulted in an extremely dispersed form of settlement, with the landscape characterized by a patchwork of relatively self-sufficient plantations and smaller farms. Colonial officials had long expressed concern about the scattered nature of settlement and the relative absence of urban development. By the latter years of the seventeenth century, Virginia's House of Burgesses began to draft legislation to address this perceived problem. Over the next several decades, this effort to urbanize the colony had a direct effect on this area. A 1680 act for the establishment of towns authorized the establishment of the port town of Urbanna, situated on the only accessible harbor on the south shore of the Rappahannock. Despite a protracted struggle with Ralph Wormeley, upon whose land the town site was located, Urbanna's lots were eventually laid out and the first was sold in 1691. Urbanna had grown considerably by the early years of the eighteenth century, attracting considerable residential and commercial development, and becoming the focal point of trade and commerce in Middlesex County. As such, it figured prominently on the map of Virginia published by Joshua Fry and Peter Jefferson in 1755 (Figure 8) (Reps 1972: 78-79; Ryland et al. 1980: 11-12).

During the seventeenth- and early eighteenth centuries, the project area likely was encompassed by the estate of the wealthy and prominent Robinson family known as Hewick. Christopher Robinson arrived in Virginia around 1666, and by about 1678 had built a home called "The Grange" to the south of what was later named Robinson Creek. Robinson held a number of important political offices, serving as clerk of Middlesex County, as a Burgess and Councilor, and as Secretary of State for the colony. His son, Christopher Robinson II, inherited the property when he died in 1693. The plantation eventually passed to Christopher Robinson III in 1727. It is likely he who renamed the property Hewick after the family's ancestral home in Yorkshire, and built the core of the brick house that survives, in significantly altered form, on the property today (Gray et al. 1978: 1-4; VHLC 1978; Ryland et al. 1980: 14-15).

Colony to Nation (1750-1789)

Although the "noxious weed" had shaped all aspects of economic, social, and material life in the colonial period, Tidewater Virginia's "Golden Age" of tobacco-based prosperity would be relatively short-lived. By the second half of the eighteenth century, even the great plantation-owning gentry were beginning to feel the pinch of a sputtering, century-old tobacco economy. After a few decades of prosperity, tobacco was once again on the decline by the 1760s and 1770s. Severe economic problems in England precipitated by the costly Seven Years' War reverberated throughout the colonies. Faced with economic ruin, English merchants began calling in their debts, threatening the very foundation of the Tidewater economic system. For some time, Virginians of all ranks had relied on British credit to maintain, and gradually increase, their consumption of

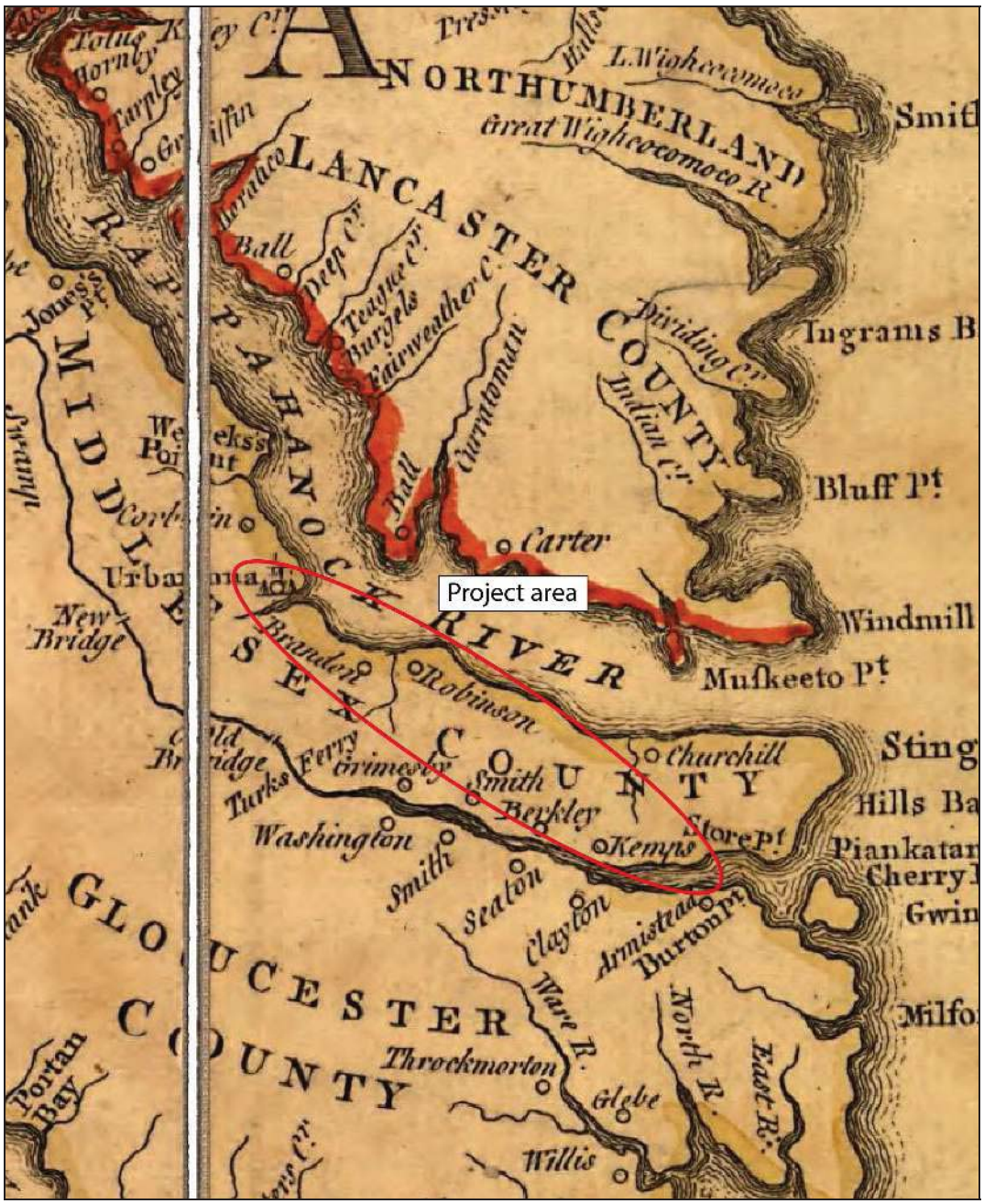


Figure 8. Location of the project corridor on detail of *A Map of the Most Inhabited Part of Virginia* (Fry and Jefferson 1755).

imported goods, thereby raising their standard of living. This constriction of credit threatened to topple even the most prominent planters (Kaplan 1993: 55, 67).

The Anglo-American commercial crisis also had significant political ramifications. Virginians and residents of other colonies balked at the growing imposition of taxes to maintain the imperial interests of Great Britain in America, and were particularly incensed by duties on imported items, of which tea was perhaps the most conspicuous example. The regular meeting of the local militia had long been a fixture of life at the county level, though it was more an opportunity for drinking and socializing than a display of martial prowess. The formerly jovial atmosphere surrounding militia training would soon take on a deadly seriousness, however, for by the following year a state of war existed between the American colonies and Great Britain, and Virginians took up arms to fight for independence. Although no major fighting occurred in this part of the Commonwealth during the Revolutionary War, the Virginia campaign of 1781 brought the rival armies through the area in the waning stages of the conflict, inflicting damage to the area's towns and farms alike. More profoundly, the Revolution effectively brought an end to Virginia's tobacco economy. During the war, the markets for Virginia tobacco were almost completely severed. Planters were forced to diversify, turning primarily to corn, wheat, and livestock for export to the West Indies. As a result, by the 1790s, tobacco had virtually disappeared north of the James River (Kaplan 1993: 55, 67).

Until the American Revolution, the region had been dominated politically, economically, and socially by a relatively small group of wealthy plantation owners who owned the preponderance of the land, slaves, and other resources. The most visible symbols of their prestige were the large stately homes that dotted the landscape, typically set on prominences overlooking the Pamunkey and Mattaponi rivers. But few could afford to live in the relative splendor enjoyed by the plantation elite. In her study of housing in the Northern Neck in the latter part of the eighteenth century, Camille Wells describes a rural landscape characterized by modest tracts of 200 acres or less. These largely self-sufficient farms had a distinct form that caught the attention of a German traveler in 1783. "A plantation in Virginia," he wrote,

> and also in the lower parts of Maryland, has often the appearance of a small village, by reason of the many small buildings, which taken all together would at times hardly go to make a single roomy and commodious house. Here are living-rooms, bed-chambers, guest-chambers, store-rooms, kitchens, quarters for the slaves, and who knows what else (Wells 1994: 6).

Wells' study of property advertisements from the *Virginia Gazette* and other records revealed each plantation as a highly structured landscape, "determined by the impulse of land-owning planters to achieve, maintain, and demonstrate their authority over others." Around the main house were arrayed a number of satellite structures, kitchens, smoke-houses, dairies, barns, sheds, and slave quarters, comprising the "small village" noted by the foreign visitor (Wells 1994: 28).

Early National and Antebellum Periods (1789-1860)

In the latter years of the eighteenth century, the entire Chesapeake region underwent a radical transition between the tobacco-based plantation economy of the colonial period and a new, diversified, grain-based economy that would characterize the region through the nineteenth and twentieth centuries. By the time of the American Revolution, all arable land in the Tidewater and Piedmont regions of Virginia had been planted in tobacco at least once, and most areas were experiencing the effects of severe soil depletion. Between 1790 and 1820, as many as 250,000 Virginians moved from the older settled parts of the state to the recently opened southwest frontier, taking approximately 150,000 enslaved African Americans with them. The virtual collapse of the tobacco economy and the resultant outmigration of significant numbers of people had a revolutionary effect on the social and economic character of the Tidewater region. Large plantations that had relied on slave labor were increasingly subdivided into smaller-scale farmsteads that grew corn and wheat rather than tobacco. This change was also reflected in the cultural landscape, as settlement tended to move away from major rivers and creeks, the primary routes of transportation and communication in the colonial period, and clustered along an increasingly complex system of interior roads (Kulikoff 1986: 422, 429).

As tobacco declined as Virginia's principal export crop, so did the once flourishing port town of Urbanna. When the British minister Harry Toulmin visited the town in 1793, he clearly was unimpressed with its current condition. "Urbanna was formerly a place of some trade and importance," he recorded,

> for as the custom house for the Rappahannock was there, the vessels were obliged to clear at that port. But the customhouse being removed to Port Royal, it is now a deserted village and as the land in the neighborhood is engrossed by a few great proprietors there are only three or four store- or shipkeepers in the town, besides some sauntering young men, the vacuity of whose countenances unites with the grass-covered streets to give the place a most melancholy aspect. I believe there are not above a dozen houses in the town (Reps 1972: 79).

Regardless of their social standing, farmers in the Rappahannock River valley found themselves confronted in the early years of the nineteenth century by land that was simply worn out by decades of tobacco farming. Meanwhile, the prevailing agricultural practice of crop rotation every three years insured that even wheat and corn depleted the soils at an alarming rate. But it was not long before a small group of far-sighted Virginians dedicated to "scientific agriculture" helped to usher in a new era of productive farming. In his series of essays entitled *Arator*, Caroline County's John Taylor demonstrated the benefits of four-field crop rotation, in which soils could be improved significantly by rotating corn, wheat, fertilizer, and clover. Similarly, in the early 1820s, Edmund Ruffin publicized the effectiveness of marl in reducing soil acidity, a technique that could triple the productivity of Tidewater soils. Other agricultural improvements included contour plowing to reduce erosion, cast iron plows, threshing machines, and corn shellers. To some extent, the improved yields offered by the new farming practices helped staunch the hemorrhaging of the region's population (Kaplan 1993: 87-88).

The introduction of new crops, and advances in farm management and fertilization had a significant effect on settlement patterns in nineteenth-century Tidewater Virginia. Lands formerly considered marginal could now be incorporated into agricultural production, a process accelerated by the increasing subdivision of family farms through inheritance. Regional locational models also suggest that soil type and slope remained the most important factors influencing nineteenth-century settlement patterns. Though a somewhat broader variety of soils could now be brought into production through advances in agricultural practices, areas of prime farmland and gentle slope were still most valued for farming and settlement. The resurgence of the region's agricultural economy in the first half of the nineteenth century prompted a minor industrial boom in the form of gristmills. With increasing amounts of grain for export, local farmers needed a reliable means of grinding their grain. Water-powered mills sprang up across the county, and the economic and social importance of their owners was underscored by the fact that millers were exempted from militia musters. Much official ink also was spilled in ensuring the upkeep of roads leading to mills, the quality of their output, and the accuracy of their measuring equipment (Heath 1999: 53-67; Kaplan 1993: 86).

Just as the tobacco economy had an enormous influence on the built landscape in the colonial period, the emergence of a new consumer culture in the late eighteenth- and early nineteenth centuries had a similarly transformative effect on how people lived. Like refined earthenwares or tea sets, Edward Chappell notes, buildings can also be viewed as "consumer goods." Houses, he claims, "embody attitudes toward material life and are shaped by new domestic activities and changing economic conditions." The size and design of houses say much about their occupants' perceived domestic needs, social priorities, and relative wealth. Scholars of early American architecture have increasingly noted a profound transformation in Chesapeake housing after the American Revolution that appears to correlate with a contemporary "revolution" in consumer behavior. Throughout the eighteenth century, the most common rural house type consisted of a single- or two-room frame building with little or no trim, plaster, or paint. Post-in-ground construction remained evident throughout the century, though this "impermanent" building style increasingly became associated with the most modest buildings, such as slave quarters or poor tenant households. Though the "building revolution" of the late eighteenth and early nineteenth century had more of an impact on urban dwellers and more affluent rural residents, a general change in domestic architecture has been noted archaeologically even in modest vernacular housing during this period. Attitudes towards permanence are reflected in an increasing emphasis on brick or stone foundations as opposed to earthfast building techniques, while an increasing desire for privacy, comfort, and sanitation may be reflected archaeologically by a greater division of interior space and more focused areas of domestic activity (Chappell 1994: 167-232).

During this period, local farmers had considerable success with a variety of crops, particularly corn and wheat, as well as oats and cotton. Despite slow improvements to the internal road network, the Rappahannock River still provided the quickest and most economical way of transporting goods to market, and regular passenger and freight service from Urbanna linked Middlesex County with outside markets, particularly Baltimore. In general, however, this region did not see any significant development of

the transportation infrastructure—such as canals, turnpikes, and railroads—which characterized other parts of the state in the antebellum period.

Civil War (1861-1865)

Compared with northern Virginia and the immediate vicinity of Richmond, Middlesex County witnessed relatively little direct military action during the Civil War, and no major battles. Union gunboats regularly patrolled the Rappahannock River, and on one memorable occasion in 1861 fired on the town of Urbanna, the site of a Confederate training camp. Although spared much of the destruction and bloodshed endured elsewhere in Virginia, the residents of this region still suffered considerably during the conflict. The majority of able-bodied Middlesex County men served in units of the Confederate army, leaving farms to languish in their absence. Meanwhile many local enslaved African Americans took advantage of the presence of Union forces to flee their farms and plantations. When the war came to an end in April 1865, the physical, social, and economic landscape of the county had been irreversibly altered (Ryland et al. 1980: 49-50; Atkinson 1990: 96-97; 163).

Reconstruction and Growth (1865-1917)

The combined loss of manpower and draft animals, the neglect of agricultural land, and the emancipation of the slave population had a detrimental effect on the region's economic and social landscape in the postwar era. Property values plummeted over the next several years: land that had sold for $10 per acre before the war now fetched only $1-3. In fact, the real estate market was so depressed that during their 1869-70 session the General Assembly enacted a law prohibiting the sale of land for less than 75 percent of its assessed value (Kaplan 1993: 153-56).

Even the climate appeared to be conspiring against Tidewater farmers. "A severe drought has prevailed here for a long time," noted Cornelius Hart Carlton of neighboring King and Queen County in the summer of 1872.

> I heard a man say lately that the last fall of water he had was the last snow. Our gardens are very bad; the oat crop a failure, and the corn crop set back. . . . It has been very hot for the last seven or eight days. It is so dry that the mills cannot grind (Kaplan 1993: 155).

Despite these many hardships, the region was boosted by the emergence of a strong market for local oysters, fish, and crabs, and in the late nineteenth and early twentieth centuries Urbanna became the center of a profitable seafood industry. Even so, agriculture remained the mainstay of the local economy. By the latter years of the nineteenth century, the face of Tidewater farming had shifted to market gardening. In 1892, Virginia was producing upwards of $7 million in produce. Canneries sprang up to facilitate transportation of these products to distant markets, and by 1900 the Old Dominion ranked third among states engaged in market farming and canning. Principal crops in the region now included corn, wheat, oats, rye, tobacco, potatoes, beans, and peas, as well as peanuts, sorghum, and broom-corn. In a pattern reminiscent of the early nineteenth century, postwar agricultural difficulties prompted many local farmers to seek alternative sources of income. Farm fields neglected since the Civil War had produced

stands of mature trees, providing ample resources for an expanding timber industry. While many residents chose to leave the area for jobs in Richmond or elsewhere, those who stayed and continued to farm joined the "Grange," or "Patrons of Husbandry," a fraternal order established in 1867 and dedicated to helping farmers learn new agricultural methods. Though Virginians were initially slow to join, by 1876 the organization claimed 18,000 members in Virginia in 685 local chapters. Though the Grange had lost most of its power by the 1890s, it was replaced by similar organizations, including the Farmers' Assembly and Farmers' Alliance, and the annual Farmers' Institutes (Ryland et al. 1980: 79; Kaplan 1993: 155, 176-77, 180-81, 198).

World War I to World War II (1917-1945)

Aside from a few significant changes—chiefly the emancipation of the enslaved population—this region remained much the same in the early twentieth century as it had been before the Civil War. Residents remained relatively isolated on self-sufficient farms, roads were poor, and communication was slow. Daily life revolved around the agricultural schedule, while churches continued to be important social institutions. Despite the rapid progress witnessed in urban America during these years, few in the county would have access to automobiles, electricity, or telephones for many years to come (Kaplan 1993: 199-204).

The New Dominion (1945 to Present)

Despite the rapid spread of the MSX virus that nearly wiped out the Chesapeake's oyster beds in the 1940s, Urbanna's well-established seafood industry managed to survive. The town's reputation as the oyster capital of Virginia has been bolstered by its renowned oyster festival, held annually since 1958. Middlesex County has remained largely rural and agricultural since World War II, its economy bolstered by tourism and property development by non-residents. As part of Tidewater Virginia's "Gold Coast," the county has attracted a significant retirement-age population, with the percentage of residents aged 65 and older approximately twice the state average (Edwards and Salmon 1990; Landmark Design Group 2001).

HISTORIC MAP ANALYSIS

The earliest detailed maps of those areas included within project area consist of coastal surveys completed by cartographers of the U.S. Coast Survey in the 1850s and 1860s. According to the 1856 *Map of a Portion of the Rappahannock River*, the proposed Urbanna pump station and associated TFM corridor were well beyond the developed area of the town (Figure 9). And there is no evidence of any buildings or other significant features in the vicinity of the HDD crossing of Urbanna Creek. Similarly, the 1869 *Piankatank River, Virginia* survey does not indicate any built improvements on either the north or south side of the proposed HDD crossing (Figure 10).

The earliest 15' U.S.G.S. topographic quadrangle maps including the project area were published in 1916 (Kilmarnock) and 1917 (Urbanna) (Figures 11-13). These maps

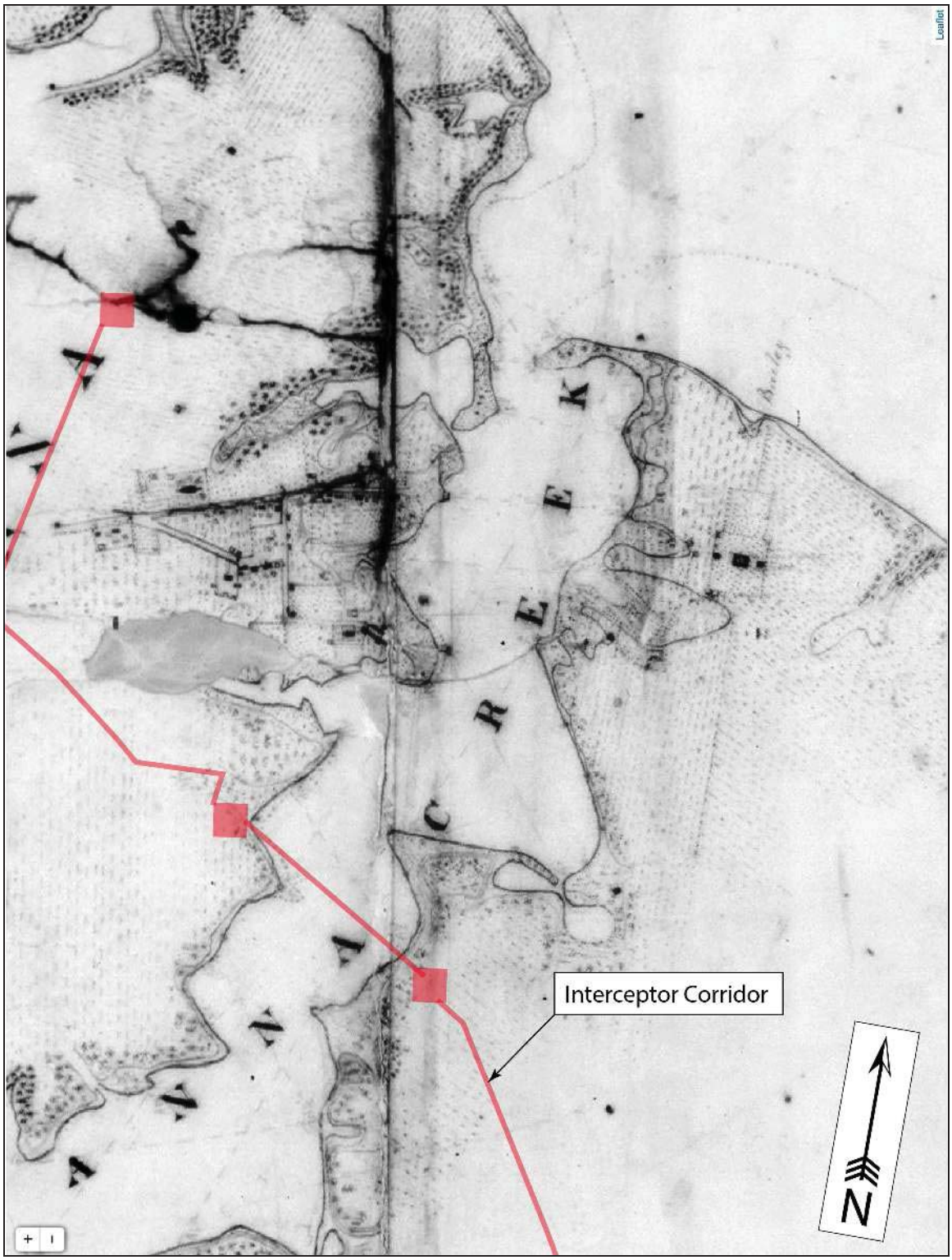


Figure 9. Location of the project corridor on detail of *Map of a Portion of the Rappahannock River*, Sheet No. 12 (Adams 1856).

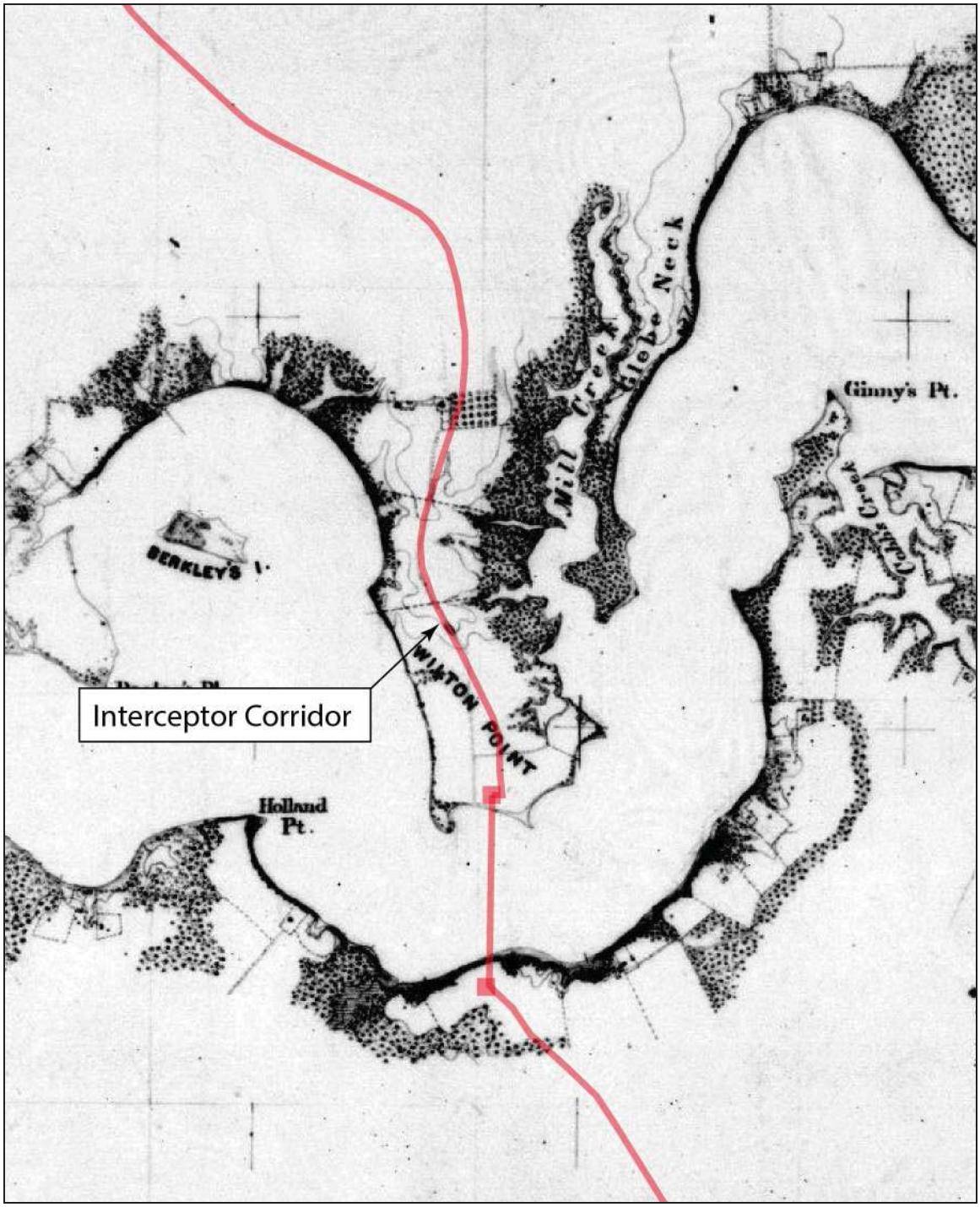


Figure 10. Location of the project corridor on detail of *Piankatank River, Virginia* (Donn 1869).

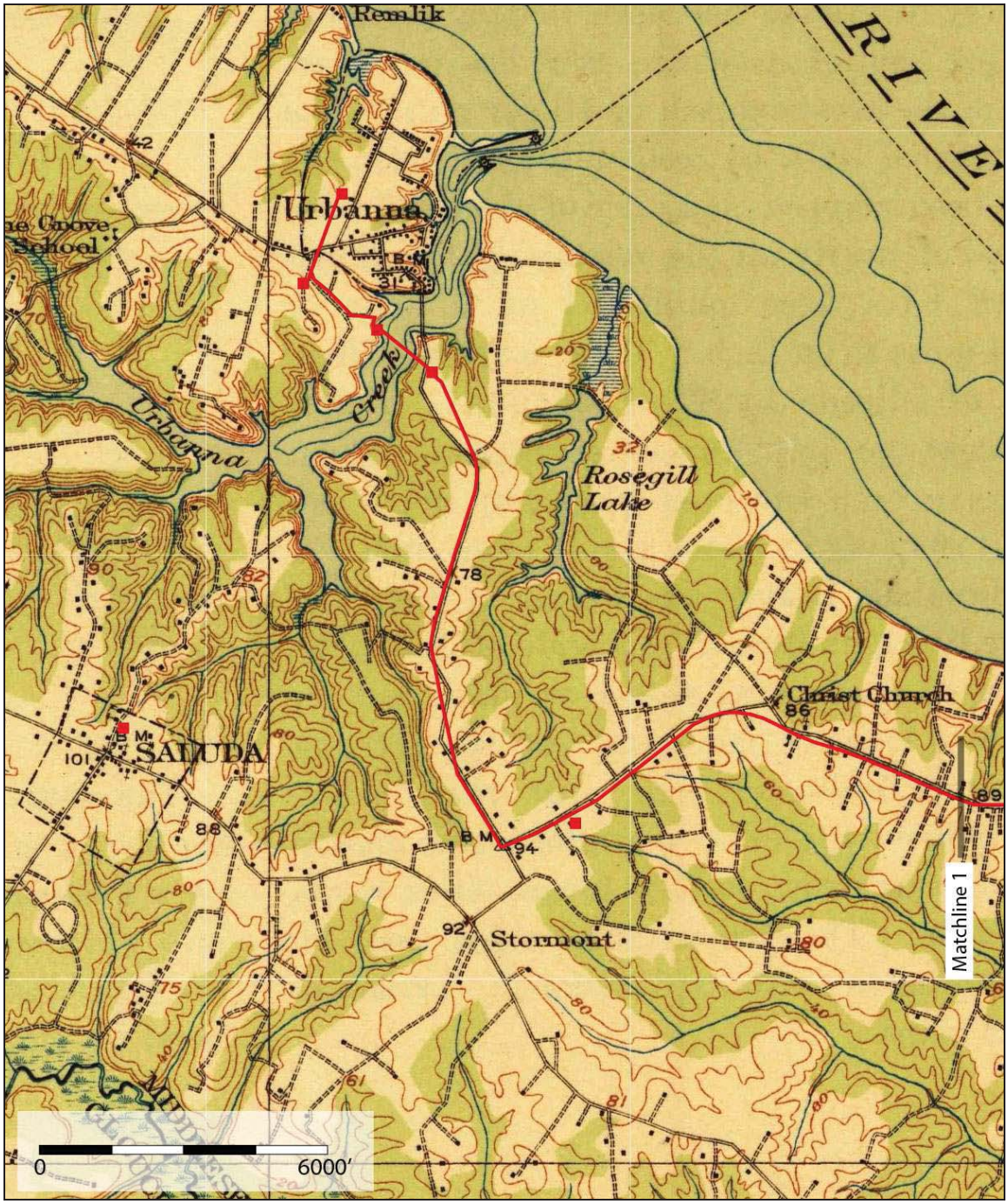


Figure 11. Location of the project corridor on detail of U.S.G.S. 15' Urbanna (1917) topographic quadrangle map.

Figure 12. Location of the project corridor on detail of U.S.G.S. 15' Urbanna (1917) and Kilmarnock (1916) topographic quadrangle maps.

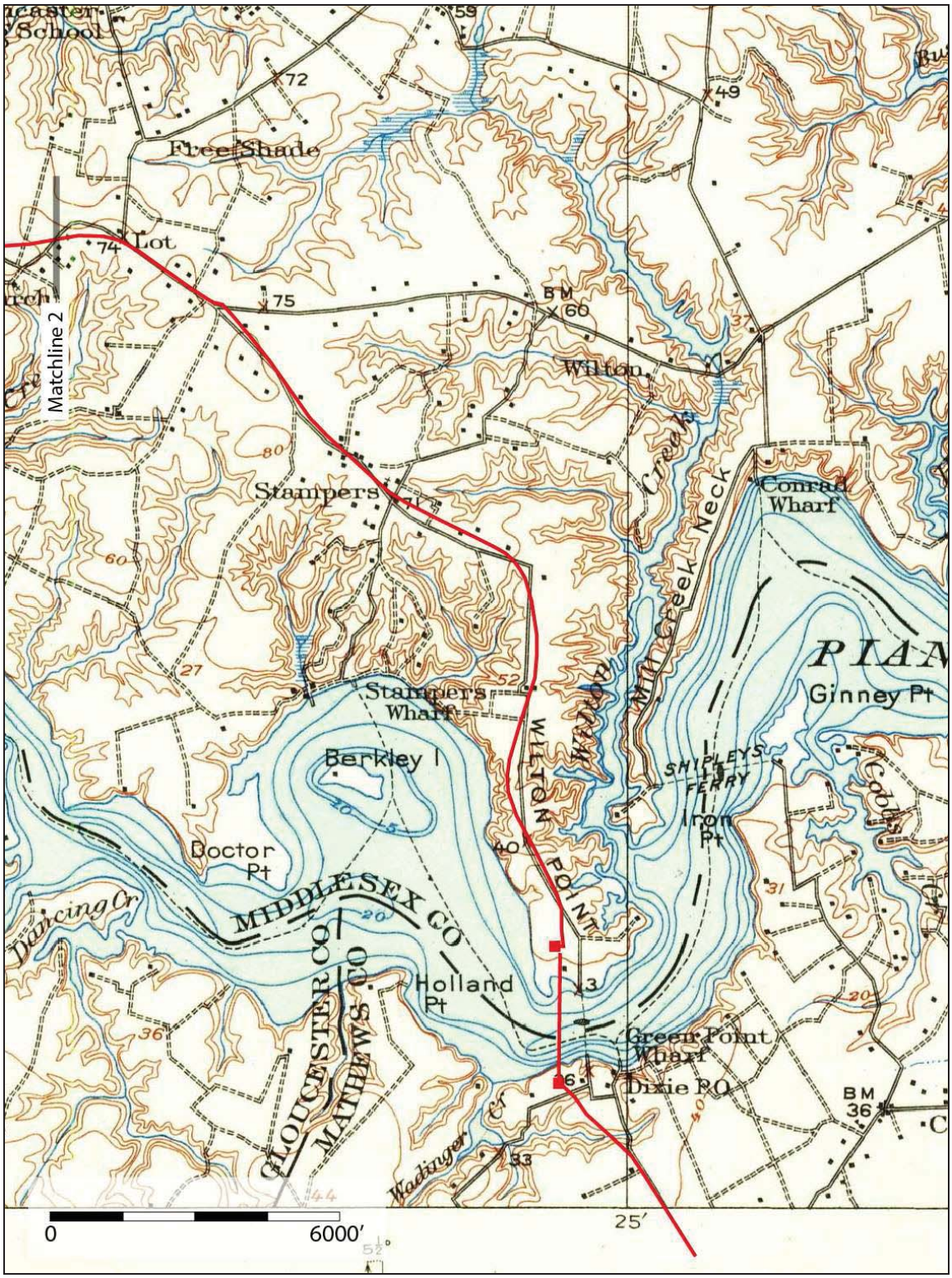


Figure 13. Location of the project corridor on detail of U.S.G.S. 15' Kilmarnock (1916) topographic quadrangle map.

that, with only some minor deviation, the precursors to the modern Routes 227, 33, and 3 followed essentially the same course as they had since the seventeenth century, when the main east-west thoroughfare, known simply as "The Road," was the main artery linking settlements across the county, extending 35 miles from the northwest corner of Middlesex County to the Chesapeake Bay. The section of the current Route 33 between Cooks Corner and Harmony Village was then a branch of the main road (which followed what is now Route 629). It was known as "the Church Path" because it led to ca. 1712 Christ Church, familiarly called the "Mother Church," of which the Wormeleys of Rosegill were the primary patrons (Galluci et al. 1992: 10).

There are two notable differences between the early twentieth-century transportation routes depicted on these maps and the present. A section of what is now Route 227 immediately south of Urbanna Creek was located to the west of the current right-of-way. And the current Route 3 terminated at the south end of Wilton Point, where Twigg's Ferry crossed the Piankatank River to Mathews County before the John Andrew Twigg Bridge was built in 1953.

III. PREVIOUSLY RECORDED CULTURAL RESOURCES

The following section details all cultural resources (including historic districts, standing structures, and archaeological sites) recorded in the DHR's Virginia Cultural Resource Information System (V-CRIS) within 100 feet of the proposed Saluda, Urbanna, and Cooks Corner pump stations, Middlesex TFM corridor, and associated HDD crossings.

DHR V-CRIS Map 1 (Figure 14)

The proposed location of the Central Middlesex Treatment Plant pump station is in the parking lot adjacent to the existing wastewater treatment plant, which is situated to the north of the Middle Peninsula Regional Security Center. The proposed pump station location is within 100 feet of the northern boundary of the Saluda Historic District (DHR ID# 059-5124) which has been determined eligible for listing in the National Register. There are no other previously recorded archaeological or architectural resources in the immediate vicinity.

Figure 14. DHR V-CRIS Map 1.

Figure 15. DHR V-CRIS Map 2.

DHR V-CRIS Map 2 (Figure 15)

The proposed location of the Urbanna Treatment Plant pump station (Alternate 2) and the associated TFM corridor within the limits of the Town of Urbanna are situated outside of the boundaries of the Urbanna Historic District (DHR ID# 316-0009), which is listed in the National Register and the Virginia Landmarks Register. On the south of Route 602/Virginia Street, the proposed location of the Urbanna Treatment Plant pump station (Alternate 1), TFM corridor, and HDD rig on the west side of Urbanna Creek do not coincide with any previously recorded archaeological or architectural resources.

Figure 16. DHR V-CRIS Map 3.

DHR V-CRIS Map 3 (Figure 16)

Archaeological Resources

The proposed location of the HDD stringout on the east side of Urbanna Creek is in the immediate vicinity of previously recorded Site 44MX0052. This site was first recorded in the course of a Phase I surface collection survey of Rosegill completed by Cultural Resources, Inc. (CRI) on behalf of Rosegill Development LLC in 2006. CRI subsequently conducted a Phase II investigation of the site which suggested that it represents a multi-component prehistoric/historic resource with evidence of occupation during the Middle Woodland through Contact periods, and the nineteenth century. Shovel testing and test unit excavation during the Phase I and II investigations yielded a variety of Native American artifacts, including Mockley (Middle Woodland), Roanoke (Contact Period), and unidentified ceramics, debitage/shatter, a biface, groundstone fragments, a cobble tool, and fire-cracked rock. Given the date of the prehistoric artifacts, it is possible that this site is associated with the village of Opiscopank mapped by John Smith, and/or the subsequent Nimcock towns described by Ralph Wormeley (see Figure 6). Based on the results of the Phase II investigation, CRI recommended that the prehistoric Native American site component was eligible for listing in the National Register under Criterion D, but that the historic component was not eligible (Brady et al. 2006). To date, the DHR has not reviewed the CRI Phase II report nor concurred with these recommendations

In the course of their 2006 Phase I survey, CRI also recorded a section of relict road trace corresponding with the precursor to the current Route 227 (see Figure 11). The southern end of the road trace is in the vicinity of the TFM corridor on the west side of Route 227. The National Register eligibility of this resources has not been evaluated.

Architectural Resources

The boundary of the Rosegill property (DHR ID# 059-0009), which is listed in the National Register and Virginia Landmarks Register, runs along the east side of Route 227.

Figure 17. DHR V-CRIS Map 4.

DHR V-CRIS Map 4 (Figure 17)

Architectural Resources

The TFM corridor bypasses one previously recorded architectural resource adjacent to the west side of Route 227:

- House, 1103 Urbanna Road (DHR ID# 059-5174), ca. 1940, National Register eligibility not evaluated.

Figure 18. DHR V-CRIS Map 5.

DHR V-CRIS Map 5 (Figure 18)

Architectural Resources

The TFM corridor bypasses three previously recorded architectural resources adjacent to the west side of Route 33:

- House, 281 Urbanna Road (DHR ID# 059-5175), ca. 1954, National Register eligibility not evaluated.
- House, 267 Urbanna Road (DHR ID# 059-5176), ca. 1950, National Register eligibility not evaluated.
- Store, 147-165 Urbanna Road (DHR ID# 059-5177), ca. 1950, National Register eligibility not evaluated.

The TFM corridor bypasses one previously recorded architectural resource adjacent to the east side of Route 33:

- G.L. Davis Service Center, Café, and Tavern (DHR ID# 059-5424), pre-1960, National Register eligibility not evaluated.

There are no previously recorded archaeological or architectural resources in the immediate vicinity of the proposed Cooks Corner pump station location.

Figure 19. DHR V-CRIS Map 6.

DHR V-CRIS Map 6 (Figure 19)

Architectural Resources

The TFM corridor bypasses four previously recorded architectural resources adjacent to the east side of Route 33:

- House, General Puller Highway (DHR ID# 059-0032), pre-1960, no longer extant.
- Farm, 8049 General Puller Highway (DHR ID# 059-5099), ca. 1928, National Register eligibility not evaluated.
- House, 8307 General Puller Highway (DHR ID# 059-5377), ca. 1952, National Register eligibility not evaluated.
- House, 8433 General Puller Highway (DHR ID# 059-5379), ca. 1964, determined not eligible for the National Register.

The TFM corridor bypasses one previously recorded architectural resource adjacent to the west side of Route 33:

- House, 8364 General Puller Highway (DHR ID# 059-5378), ca. 1920, determined not eligible for the National Register.

Figure 20. DHR V-CRIS Map 7.

DHR V-CRIS Map 7 (Figure 20)

Archaeological Resources

The TFM corridor bypasses Site 44MX0073, which is located within 100 feet of the east side of Route 33. The site was identified by Dutton + Associates, Inc. in 2017 in the course of a Phase I survey of the proposed Puller Solar project area. The site consisted of a scatter of late nineteenth-/early twentieth-century artifacts, and the DHR concurred that the site is not eligible for listing in the National Register.

Architectural Resources

The TFM corridor bypasses two previously recorded architectural resources adjacent to the east side of Route 33:

- House, 8519 General Puller Highway (DHR ID# 059-5380), ca. 1900, determined not eligible for the National Register.
- House, 9 Bobs Hole Road (DHR ID# 059-5382), ca. 1930, determined not eligible for the National Register.

The TFM corridor bypasses two previously recorded architectural resources adjacent to the west side of Route 33:

- House, 8656 General Puller Highway (DHR ID# 059-5381), ca. 1940, determined not eligible for the National Register.
- House, 9144 General Puller Highway (DHR ID# 059-5383), ca. 1890, determined not eligible for the National Register.

Figure 21. DHR V-CRIS Map 8.

DHR V-CRIS Map 8 (Figure 21)

Architectural Resources

The TFM corridor bypasses four previously recorded architectural resources adjacent to the east side of Route 33:

- Store, 10675 General Puller Highway (DHR ID# 059-5083), ca. 1874, National Register eligibility not evaluated.
- House, 10715 General Puller Highway (DHR ID# 059-5082), ca. 1912, National Register eligibility not evaluated.
- House, 10801 General Puller Highway (DHR ID# 059-5085), ca. 1940, National Register eligibility not evaluated.
- House, 10889 General Puller Highway (DHR ID# 059-5084), ca. 1875, National Register eligibility not evaluated.

The TFM corridor bypasses one previously recorded architectural resource adjacent to the west side of Route 33:

- Lower United Methodist Church (DHR ID# 059-0007), ca. 1717, listed in the National Register/Virginia Landmarks Register.

Figure 22. DHR V-CRIS Map 9.

DHR V-CRIS Map 9 (Figure 22)

Archaeological Resources

The TFM corridor bypasses Site 44MX0050, which is adjacent to the east side of Route 3. The site was identified by WMCAR in 2004 in the course of a Phase I survey for the Route 630 project. The site represented the remains of a store which operated at the site from the 1920s through the 1970s. The DHR concurred that the site is not eligible for listing in the National Register.

Architectural Resources

The TFM corridor bypasses three previously recorded architectural resources adjacent to the east side of Route 3:

- City of Refuge Church, 20 City of Refuge Road (DHR ID# 059-5061), ca. 1920, National Register eligibility not evaluated.
- Kent's Store, Routes 3 and 630 (DHR ID# 059-5007), ca. 1930, determined not eligible for the National Register.
- Thomas House, Routes 3 and 630 (DHR ID# 059-5008), ca. 1945, determined not eligible for the National Register.

Figure 23. DHR V-CRIS Map 10.

DHR V-CRIS Map 10 (Figure 23)

The boundary of Wilton (DHR ID# 059-0010) runs along the west side of Route 3. This historic property, which dates to 1763, is listed in the National Register/Virginia Landmarks Register, and is subject to an historic preservation easement held by the Virginia Board of Historic Resources.

Figure 24. DHR V-CRIS Map 11.

DHR V-CRIS Map 11 (Figure 24)

The HDD drill rig location on the north side of the Piankatank River is adjacent to the ca. 1953 John Andrew Twigg Bridge (DHR ID# 057-5047) which carries Route 3 across the river. The DHR has determined that this resource is not eligible for listing in the National Register.

There are no additional archaeological or architectural resources recorded within the immediate vicinity of the HDD drill rig or pipe string locations. The south shore of the Piankatank River in the vicinity of the HDD pipe string location was investigated by the Chesapeake Watershed Archaeological Research Foundation in 2008 in the course of a Phase I archaeological survey of coastal shorelines in Mathews County (Lowery 2008). The survey identified no archaeological sites along the river shore in this vicinity.

IV. RECOMMENDATIONS

Considering the extent of existing "urban" disturbances within the proposed pump station locations in Saluda, Urbanna, and Cooks Corner, there is relatively low potential for any effects to significant, intact archaeological resources. Similarly, WMCAR identified no new archaeological sites in the course of their 1991 Phase I survey of the 5.3-mile Route 33 right-of-way between Cooks Corner and Harmony Village. "Modern 20th-century debris constituted the largest percentage of material recovered," they reported. "Many areas of the survey were severely disturbed due to modern construction and land use (Gallucci et al. 1992: ii). It is anticipated that conditions within the remainder of the VDOT right-of-way will be similarly disturbed, and JRIA therefore recommends that the potential for identifying significant, intact archaeological resources along the proposed Middlesex TFM is low.

The greatest potential for disturbance to archaeological resources which may be eligible for listing in the National Register will be from the HDD under Urbanna Creek and the Piankatank River. The proposed HDD stringout location on the east side of Urbanna Creek is in the immediate vicinity of Site 44MX0052, which includes evidence of Native American occupation during the Middle and Late Woodland periods, and which may be associated with the Contact Period Opiscopank/Nimcock villages. Considering its situation adjacent to Urbanna Creek, the HDD rig location on the west side of Urbanna Creek may also include prehistoric Native American remains. While there are no previously recorded archaeological sites associated with the proposed HDD impact areas on the north and south sides of the Piankatank River, these riverside locations offer relatively high potential for identifying both prehistoric and historic archaeological sites.

If possible, JRIA recommends that the Middlesex TFM should avoid direct impacts within the defined boundaries of Rosegill (DHR ID# 059-0009), which is listed in the National Register/Virginia Landmarks Register, and Wilton (DHR ID# 059-0010), which is listed in the National Register/Virginia Landmarks Register, and is subject to an historic preservation easement held by the Virginia Board of Historic Resources.

V. REFERENCES

Adams, Hull
1856 *Map of a Portion of the Rappahannock River*, Sheet No. 12. U.S. Coast Survey Map Collection, University of Alabama, Tuscaloosa, Alabama.

Atkinson, Dorothy Francis
1990 *King William County in the Civil War: Along Mangohick Byways*. H.E. Howard, Inc., Lynchburg, Virginia.

Barfield, Eugene B., and Michael B. Barber
1992 "Archaeological and Ethnographic Evidence of Subsistence in Virginia during the Late Woodland Period," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Middle and Late Woodland Research in Virginia: A Synthesis*, pp. 225-48. Special Publication No. 29 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Brady, Ellen, Aimee J. Leithoff, and Kevin Goodrich
2006 *A Phase II Archaeological Evaluation of Sites 44MX0051, 44MX0052, 44MX0053, 44MX0054 and 44MX0056, Proposed Rosegill Development, Middlesex County, Virginia.* Cultural Resources, Inc., Norfolk, Virginia.

Carr, Lois Green, and Lorena S. Walsh
1994 "Changing Lifestyles and Consumer Behavior in the Colonial Chesapeake," in Cary Carson, Ronald Hoffman, and Peter J. Albert (eds.), *Of Consuming Interests: The Style of Life in the Eighteenth Century*, pp. 59-166. University Press of Virginia, Charlottesville.

Chapman, Jefferson, and Andrea Brewer Shea
1981 "The Archaeobotanical Record: Early Archaic Period to Contact in the Lower Little Tennessee River Valley." *Tennessee Anthropologist* VI (1):61-84.

Chappel, Edward A.
1994 "Housing a Nation: The Transformation of Living Standards in Early America," in Cary Carson, Ronald Hoffman, and Peter J. Albert (eds.), *Of Consuming Interests: The Styles of Life in the Eighteenth Century,* pp. 167-232. University Press of Virginia, Charlottesville.

Custer, Jay F.
1990 "Early and Middle Archaic Cultures of Virginia: Cultural Change and Continuity," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Early and Middle Archaic Research in Virginia: A Synthesis*, pp. 1-60. Special Publication No. 22 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Dent, Richard J., Jr.
1995 *Chesapeake Prehistory: Old Traditions, New Directions*. Plenum Press, New York.

Donn, J.W.
1869 *Piankatank River, Virginia*. U.S. Coast Survey Map Collection, University of Alabama, Tuscaloosa, Alabama.

Edwards, David A., and John S. Salmon
1990 National Register of Historic Places Nomination for the Urbanna Historic District (DHR ID# 316-0009). Virginia Department of Historic Resources, Richmond, Virginia.

Egloff, Keith T.
1991 "Development and Impact of Ceramics in Virginia," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Late Archaic and Early Woodland Research in Virginia: A Synthesis*, pp. 243-51. Special Publication No. 23 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Fry, Joshua, and Peter Jefferson
1755 *A Map of the Most Inhabited Part of Virginia Containing the Whole Province of Maryland with a part of Pensilvania* [sic.], *New Jersey and North Carolina*. Library of Congress, Geography and Map Division, Washington, D.C.

Gallucci, Mark, Scott M. Hudlow, and Charles M. Downing
1992 *A Phase I Cultural Resource Survey of the Proposed Route 33 Project, Middlesex County, Virginia*. William and Mary Center for Archaeological Research, The College of William and Mary, Williamsburg, Virginia.

Gardner, William M.
1974 "The Flint Run Paleoindian Complex: A Preliminary Report 1971-1973 Seasons." *Occasional Publication* No. 1, Archeology Laboratory, The Catholic University of America, Washington, D.C.

1977 "Flint Run Paleoindian Complex, its Implication for Eastern North American Prehistory." In *Amerinds and Their Paleoenvironment in Northeastern North America*. edited by W. S. Mewman and B. Salwen, pp 257-263. *Annals of the New York Academy of Sciences* 288.

1981 "Paleoindian Settlement Pattern and Site Distribution in the Middle Atlantic." *Anthropological Careers*, edited by R. H. Landman, L. A. Bennett, A. Brooks, and P. P. Chock, pp. 51-73. Anthropological Society of Washington, Washington, D.C.

1989 "An Examination of Cultural Change in the Late Pleistocene and Early Holocene (circa 9200 to 6800 B.C.)." In *Paleoindian Research in Virginia: A*

Synthesis. edited by J. Mark Wittkofski and Theodore R. Reinhart, pp. 5-52. *Special Publication* No. 19 of the Archeological Society of Virginia.

Geier, Clarence
1990 "The Early and Middle Archaic Periods: Material Culture and Technology," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Early and Middle Archaic Research in Virginia: A Synthesis,* pp. 81-98. Special Publication No. 22 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Gray, Louise E., Evelyn Q. Ryland, and Bettie J. Simmons
1978 *Historic Buildings in Middlesex County, Virginia, 1650-1875*. Delmar Printing Company, Charlotte, North Carolina.

Heath, Barbara J.
1999 "Nineteenth-Century Small Farms and Plantations," in John H. Sprinkle and Theodore R. Reinhart (eds.), *The Archaeology of 19th-Century Virginia*. Special Publication No. 36 of the Archeological Society of Virginia, Spectrum Press, Richmond, Virginia.

Herrman, Augustine
1673 *Virginia and Maryland as it is Planted and Inhabited this Present Year 1670*. Library of Congress, Geography and Map Division, Washington, D.C.

Hodges, Mary Ellen N., and Charles T. Hodges, editors
1994 *Paspahegh Archaeology: Data Recovery Investigations of Site 44JC308 at The Governor's Land at Two Rivers, James City County, Virginia*. Prepared by James River Institute for Archaeology, Inc. Williamsburg, Virginia.

Kaplan, Barbara Beigun
1993 *Land and Heritage in the Virginia Tidewater: A History of King and Queen County*. Cadmus Fine Books, Richmond, Virginia.

Kulikoff, Allan
1986 *Tobacco and Slaves: The Development of Southern Cultures in the Chesapeake, 1680-1800.* University of North Carolina Press, Chapel Hill, North Carolina.

LandMark Design Group
2001 *County of Middlesex Virginia Comprehensive Plan Update 2001: Charting the Course*. Virginia Beach, Virginia.

Lowery, Darrin L.
2008 *Archaeological Survey of the Coastal Shorelines Associated with Mathews County, Virginia: An Erosion Threat Study.* Chesapeake Watershed Archaeological Research Foundation, Easton, Maryland.

Lukezic, Craig
1990 "Soils and Settlement Location in 18th Century Colonial Tidewater Virginia." *Historical Archaeology* 24 (1): 1-17.

McAvoy, Joseph M., and Lynn D. McAvoy
1997 "Archaeological Investigations of Site 44SX202, Cactus Hill, Sussex County, Virginia." *Research Report Series* No. 8, Virginia Department of Historic Resources, Richmond, Virginia.

McCary, Ben C.
1951 "A Workshop of Early Man in Dinwiddie County, Virginia." *American Antiquity* 17(1): 9-17.

1975 "The Williamson Paleoindian Site, Dinwiddie County, Virginia." *The Chesopiean,* 13(3-4): 48-131.

1983 The Paleoindian in Virginia. *Archeological Society of Virginia Quarterly Bulletin* 38(1): 43-70.

Norris, Walter Biscoe Jr.
1983 *Westmoreland County, Virginia, 1653-1983*. Westmoreland County Board of Supervisors, Montross, Virginia.

Nugent, Nell Marion (ed.)
1992 *Cavaliers and Pioneers: Abstracts of Virginia Land Patents and Grants, Vol. 1: 1623-1666*. Virginia State Library and Archives, Richmond, Virginia.

Potter, Stephen R.
1993 *Commoners, Tribute, and Chiefs: The Development of Algonquian Culture in the Potomac Valley*. University Press of Virginia, Charlottesville, Virginia.

Reps, John W.
1972 *Tidewater Towns: City Planning in Colonial Virginia and Maryland*. University Press of Virginia, Charlottesville, Virginia.

Rountree, Helen C.
1989 *The Powhatan Indians of Virginia*. The University of Oklahoma Press, Norman, Oklahoma.

Rutman, Darret B., and Anita H. Rutman
1984 *A Place in Time: Middlesex County, Virginia, 1650-1750*. W. W. Norton & Company, New York.

Ryland, Evelyn Q., Bettie J. Simmons, Larry S. Chowning, Louise E. Gray, and Florence R. Vaughn
1980 *Urbanna: A Port Town in Virginia, 1680-1980*. Delmar Printing Company, Charlotte, North Carolina.

Smith, John
1624 *Virginia Discovered and Discribed* [sic.]. Library of Congress, Geography and Map Division, Washington, D.C.

Stewart, Michael
1992 "Observations on the Middle Woodland Period of Virginia: A Middle Atlantic Region Perspective," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Middle and Late Woodland Research in Virginia: A Synthesis*, pp. 1-38. Special Publication No. 29 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Turner, E. Randolph, III
1989 "Paleoindian Settlement Patterns and Population Distribution in Virginia." In *Paleoindian Research in Virginia: A Synthesis*. Edited by J. Mark Wittkofski and Theodore R. Reinhart, pp. 71-94. *Special Publication* No. 19 of the Archeological Society of Virginia.

1992 "The Virginia Coastal Plain During the Late Woodland Period," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Middle and Late Woodland Research in Virginia: A Synthesis*, pp. 97-136. Special Publication No. 29 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Turner, E. Randolph, III, and Antony F. Opperman
1995 *Searching for Virginia Company Period Sites: An Assessment of Surviving Archaeological Manifestations of Powhatan-English Interactions, A.D. 1607-1624*. Draft manuscript.

United States Geological Survey (U.S.G.S.)
1916 15' Urbanna topographic quadrangle map.

1917 15' Urbanna topographic quadrangle map.

1978 7.5' Urbanna topographic quadrangle map.

1980 7.5' Ware Neck topographic quadrangle map.

1984 1:100,000 Tappahannock topographic quadrangle map.

1984 1:100,000 Williamsburg topographic quadrangle map.

1986 7.5' Saluda topographic quadrangle map.

1992 7.5' Wilton topographic quadrangle map.

Virginia Department of Historic Resources (DHR)
2010 "Opiscopank—Smith's Mystery Town." Historical Highway Marker N-78. Accessed at: <https://vcris.dhr.virginia.gov/HistoricMarkers/>.

Virginia Historic Landmarks Commission (VHLC)
1978 National Register of Historic Places Nomination for Hewick (DHR ID# 059-0006). Virginia Department of Historic Resources, Richmond, Virginia.

Wells, Camille
1994 "Social and Economic Aspects of Eighteenth-Century Housing on the Northern Neck." Unpublished doctoral dissertation, The College of William and Mary, Williamsburg, Virginia.

Yarnell, Richard A.
1976 "Early Plant Husbandry in Eastern North America." In *Cultural Change and Continuity: Essays in Honor of James Bennett Griffin*, edited by Charles E. Cleland, Academic Press, New York.

Appendix B: Joint Permit Application – Fiber Optic Cable Installation/Piankatank River Crossing

Howell, Beth (MRC)

From: Feairheller, Kurt [kurtf@croftondiving.com]
Sent: Monday, November 07, 2011 11:50 AM
To: MRC - jpa Permits
Cc: Crofton, Jay
Subject: Piankatank River-Crofton-MetroCast Fiber Optic Cable Installation Permit Application
Attachments: JPA-Metrocast-Piankatank.pdf

Good morning. Please find attached our Joint Permit Application for the proposed fiber optic cable installation project crossing the Piankatank River. Please let me know if you have any questions or require any further information.

Kurt S. Feairheller
Project Manager/Diving Supervisor
Crofton Industries
757-397-1131-Office
757-418-1417-Cell

CROFTON Industries
Design/Build Utility and Construction Projects Since 1949

CROFTON Industries

Design/Build Utility and Construction Projects Since 1949

GANS COMMUNICATIONS, L.P., DBA METROCAST COMMUNICATIONS
FIBER OPTIC SUBMARINE CABLE INSTALLATION

JOINT PERMIT APPLICATION

RECEIVED

By Virginia Marine Resources Commission at 1:00 pm, Nov 07, 2011

PLEASE PRINT OR TYPE ALL ANSWERS. If a question does not apply to your project, please print N/A (not applicable) in the space provided. ***If additional space is needed, attach extra 8 ½ x 11 inch sheets of paper.***

CHECK ONE, if applicable:	Pre-Construction Notification (PCN) ☒ *(For Nationwide Permits ONLY)*	SPGP ☐

1. PROJECT LOCATION INFORMATION
(Attach a copy of a detailed map, such as a USGS topographic map or street map showing the site location and project boundary, so that it may be located for inspection. Include an arrow indicating the north direction.)

Address	City/County
SEE ATTACHED MAP	MIDDLESEX COUNTY - MATHEWS COUNTY
Subdivision	Lot/Block/Parcel #

Name of water body(ies) within project boundaries and drainage area (acres or square miles)

PIANKATANK RIVER

Tributary(ies) to: CHESAPEAKE BAY
Basin: PIANKATANK RIVER Subbasin: _____
(Example: Basin: James River Subbasin: Middle James River)

Special Standards (based on DEQ Water Quality Standards 9VAC25-260 et seq.): _____

Project type (check one)
_____ Single user (private, non-commercial, residential)
__X__ Multi-user (community, commercial, industrial, government)

Latitude and longitude at center of project site: 37 - 30 - 36.01 / 76 - 25 - 11.96

USGS topographic map name: Tappahannock Topo Map LAT 37.5273N LONG 76.424W

8- digit USGS Hydrologic Unit Code (HUC) for your project site (See www.epa.gov/surf/): 02080101 and 02080102
If known, indicate the 10-digit and 12-digit USGS HUCs (see http://www.dcr.virginia.gov/soil_&_water/hu.shtml):
0202080102

Name of your project (*Example: Water Creek driveway crossing*) Piankatank River Submarine Fiber Optic Cable Installation

Is there an access road to the project? X Yes __ No. If yes, check all that apply: X public X private __ improved __ unimproved

Provide driving directions to your site, giving distances from the best and nearest visible landmarks or major intersections:

Travelling North on VA RT. 17 to Gloucester, turn right on Main Street for 1 mile. Turn right on to RT. 3 and follow for approximately 6 miles and bear left staying on RT. 3. Follow RT. 3 for approximately 2 miles turning right and staying on RT. 3. Follow for approximately 3 miles turn left on Twiggs Ferry Road (RT 3) and follow for approximately 1 mile to the bridge. The installation landfall sites are to the north and south on the west side of the bridge.

Does your project site cross boundaries of two or more localities (i.e. cities/counties/towns)? X Yes __ No
If so, name those localities: Middlesex County and Mathews County

FOR AGENCY USE ONLY

RECEIVED
NOV 07 2011
MARINE RESOURCES COMMISSION

Notes:

JPA# 11-1642

2. APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR INFORMATION

The applicant(s) is/are the legal entity to which the permit may be issued. The applicant(s) can either be the property owner(s) or the person/people/company(ies) that intend(s) to undertake the activity. The agent is the person or company that is representing the applicant(s). If a company, please use the company name that is registered with the State Corporation Commission (SCC), or indicate no registration with the SCC.

Applicant(s) (For a company, use SCC-registered name)			Agent (if applicable) (For a company, use SCC-registered name)		
Gans Communications, L.P., dba MetroCast Comm.			Jay Crofton - Crofton Diving Corporation		
Mailing address			Mailing address		
P.O. Box 1147/ 126 Urbana Rd.			16 Harper Avenue		
City	State	Zip Code	City	State	Zip Code
Saluda	VA	23149	Portsmouth	VA	23707
Phone number w/area code	Fax		Phone number w/area code	Fax	
			(757) 397-1131	(757) 397-8693	
Mobile/pager	E-mail		Mobile/pager	E-mail	
	robt@metrocast.com				
State Corporation Commission ID number (if applicable)			State Corporation Commission ID number (if applicable)		
M009481-5					

Certain permits or permit authorizations may be provided via electronic mail. If the applicant wishes to receive their permit via electronic mail, please provide an e-mail address here: jcrofton@croftondiving.com

Property owner(s), if different from applicant (For a company, use SCC-registered name)			Contractor, if known (For a company, use SCC-registered name)		
			Crofton Diving Corporation		
Mailing address			Mailing address		
			16 Harper Avenue		
City	State	Zip code	City	State	Zip code
			Portsmouth	VA	23707
Phone number w/area code	Fax		Phone number w/area code	Fax	
			(757) 397-1131	(757) 397-8693	
Mobile/pager	E-mail		Mobile/pager	E-mail	
State Corporation Commission ID number (if applicable)			State Corporation Commission ID number (if applicable)		

3. PROVIDE A DESCRIPTION OF THE PROJECT, PROJECT PRIMARY AND SECONDARY PURPOSES, PROJECT NEED, INTENDED USE, AND ALTERNATIVES CONSIDERED (Attach additional sheets if necessary)

- The purpose must include any new development or expansion of an existing land use and/or proposed future use of residual land
- Describe the physical alteration of surface waters
- Include a description of alternatives considered to avoid or minimize impacts to surface waters, including wetlands, to the maximum extent practicable. Include factors such as, but not limited to, alternative construction technologies, alternative project layout and design, alternative locations, local land use regulations, and existing infrastructure
- For utility crossings, include both alternative routes and alternative construction methodologies considered
- For major surface water withdrawals, public surface water supply withdrawals, or projects that will alter instream flows, include the water supply issues that form the basis of the proposed project

1. Installation of a subaqueous fiber optic cable system under a existing overhead cable by hydro embedment plow method across the waterway.
2. Installation operations in the upland to the waterborne transition areas from the upland terminals to approximately 50' channel ward of Mean Low Water on both sides of the river is conducted by horizontal directional drilling (HDD) method with no disturbance to the shoreline areas.
3. New embedment technology allows for successful and swift installation with minimal impacts during construction.
4. The existing location is the only option to conduct the relocation project.

3. PROVIDE A DESCRIPTION OF THE PROJECT (Continued)

Date of proposed commencement of work (MM/DD/YYYY) 02/01/2012	Date of proposed completion of work (MM/DD/YYYY) 03/01/2012
Are you submitting this application at the direction of any State, local, or Federal agency? _____Yes __X__No	Has any work commenced or has any portion of the project for which you are seeking a permit been completed? _____ Yes __X__ No

If you answered "yes" to either question above, give details stating when the work was completed and/or when it commenced, who performed the work, and which agency (if any) directed you to submit this application. In addition, you will need to clearly differentiate between completed work and proposed work on your project drawings.

Are you aware of any unresolved violations of environmental law or litigation involving the property? _____Yes __X__No
(If yes, please explain)

4. PREVIOUS SITE VISITS AND/OR PERMITS RELATED TO THE PROPOSED WORK (Include all Federal, State, and Local pre-application coordination or previous permits)

Agency	Activity	Permit/Project number, and explanation of non-reporting Nationwide permits previously used	Action taken ** and Date of Action	If denied, give reason for denial

** Issued, denied, site visit

5. PROJECT COSTS

Approximate cost of the entire project, including materials and labor: $ 200,000.00

Approximate cost of only the portion of the project affecting State waters (below mean low water in tidal areas and below ordinary high water mark in nontidal areas): $ 175,000.00

6. PUBLIC NOTIFICATION (Attach additional sheets if necessary)

- Complete information for all property owners adjacent to the project site and across the waterway, if the waterway is less than 500 feet in width. If your project is located within a cove, you will need to provide names and mailing addresses for all property owners within the cove.
- If you own the adjacent lot, provide the requested information for the first adjacent parcel beyond your property line.

Property owner's name	Mailing address	City	State	Zip code
See attached property owner information				

Name of newspaper having general circulation in the area of the project: Gloucester - Mathews Gazette - Journal
Address and phone number (including area code) of newspaper P.O. Box 2060 Gloucester, VA 23061 Phone: (804) 693-3101

Have adjacent property owners been notified with forms in Appendix A? _X_ Yes _____ No (attach copies of distributed forms)

7. THREATENED AND ENDANGERED SPECIES INFORMATION

Please provide any information concerning the potential for your project to impact state and/or federally threatened and endangered species (listed or proposed). Attach correspondence from agencies and/or reference materials that address potential impacts, such as database search results or your Corps' waters and wetlands delineation confirmation. Contact information for the Virginia Department of Game and Inland Fisheries and the Virginia Department of Conservation and Recreation, Division of Natural Heritage can be found on page 4 of this package.

8. HISTORIC RESOURCES INFORMATION

Note: Historic properties include but are not limited to archeological sites, battlefields, Civil War earthworks, graveyards, buildings, bridges, canals, etc. Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant.

Are any historic properties located within or adjacent to the project site? ____ Yes ____ No
_X_ Uncertain
If Yes, please provide a map showing the location of the historic property within or adjacent to the project site.

Are there any buildings or structures 50 years old or older located on the project site? ____ Yes ____ No _X_ Uncertain
If Yes, please provide a map showing the location of these buildings or structures on the project site.

Is your project located within a historic district? ____ Yes ____ No _X_ Uncertain
If Yes, please indicate which district: _____

8. HISTORIC RESOURCES INFORMATION (Continued)

Has a survey to locate archeological sites and/or historic structures been carried out on the property?
___ Yes ___ No _X_ Uncertain

If Yes, please provide the following information: Date of Survey: _____

Name of firm: _____

Is there a report on file with the Virginia Department of Historic Resources? ____ Yes ____ No X Uncertain

Title of Cultural Resources Management (CRM) report: _____

Was any historic property located? ____ Yes ____ No __ Uncertain

9. WETLANDS, WATERS, AND DUNES/BEACHES IMPACT INFORMATION

Report each impact site in a separate column. If needed, attach additional sheets using a similar table format. Please ensure that the associated project drawings clearly depict the location and footprint of each numbered impact site. For dredging, mining, and excavating projects, use Section 18.

	Impact site number 1	Impact site number 2	Impact site number 3
Impact description (use all that apply): F=fill EX=excavation S=Structure T=tidal NT=non-tidal TE=temporary PE=permanent PR=perennial IN=intermittent SB=subaqueous bottom DB=dune/beach IS=hydrologically isolated V=vegetated NV=non-vegetated MC=Mechanized Clearing of PFO	*Example: F, NT, PE, V* EX, T, PE, SB, NV		
Wetland/waters impact area (square feet)	See attached sheet		
Dune/beach impact area (square feet)	0 SQFT		
Stream dimensions at impact site (length and average width in linear feet, and area in sq. ft.)	1750 FT Wide (mlw to mlw)		
Volume of fill below Mean High Water or Ordinary High Water (cubic yards)	N/A		
Cowardin classification of impacted wetland/water or geomorphological classification of stream (Ex: PFO wetland; 'C' Channel Stream)	Example wetland: PFO Example stream: wide, bank eroding, braided channel Example stream: 'C' channel		
Average stream flow at site (flow rate under normal rainfall conditions) (cubic feet per second)	2 CFS		
Contributing drainage area (acres or square miles)	N/A		

9. WETLANDS/WATERS IMPACT INFORMATION (Continued)			
DEQ classification of impacted resource(s): Estuarine Class II Non-tidal waters Class III Mountainous zone waters Class IV Stockable trout waters Class V Natural trout waters Class VI Wetlands Class VII			
For DEQ permitting purposes, also submit as part of this section a wetland and waters boundary delineation map[N] – see the Footnotes section in the form instructions.			
For DEQ permitting purposes, also submit as part of this section a written disclosure of all wetlands, open water, or streams that are located within the proposed project or compensation areas that are also under a deed restriction, conservation easement, restrictive covenant, or other land-use protective instrument.			

10. APPLICANT, AGENT, OWNER, AND CONTRACTOR CERTIFICATIONS If the Applicant(s), Agent(s), Owner(s), or Contractor(s) is/are a company, please use the company name(s) that is/are registered with the State Corporation Commission (SCC).	
READ ALL OF THE FOLLOWING CAREFULLY BEFORE SIGNING	
PRIVACY ACT STATEMENT: The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the Joint Permit Application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary, but it may not be possible to evaluate the permit application or to issue a permit if the information requested is not provided.	
CERTIFICATION: I am hereby applying for permits typically issued by the DEQ, VMRC, U.S. Army Corps of Engineers, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions, both in reviewing a proposal to issue a permit and after permit issuance to determine compliance with the permit. In addition, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.	
Is/Are the Applicant(s) and Owner(s) the same? ✓ *Yes* ___ *No*	
Applicant's name & title (printed or typed) Danny L. Jobe, Vice President of System Operations	Second applicant's name & title, if applicable (printed or typed)
Applicant's signature	Second applicant's signature
Date November 5, 2011	Date
(Required for VMRC permit actions only) Property owner's name, if different from Applicant	*(Required for VMRC permit actions only)* Second property owner's name, if applicable
Owner's signature, if different from Applicant	Second owner's signature
Date	Date

10. APPLICANT, AGENT, OWNER, AND CONTRACTOR CERTIFICATIONS (Continued)
If the Applicant(s), Agent(s), Owner(s), or Contractor(s) is/are a company, please use the company name(s) that is/are registered with the State Corporation Commission (SCC).

CERTIFICATION OF AUTHORIZATION TO ALLOW AGENT(S) TO ACT ON APPLICANT'S(S') BEHALF (IF APPLICABLE)

I (we), Gans Communications, LP dba MetroCast (and) _____,
APPLICANT'S NAME(S) – *complete the second blank if more than one Applicant*

hereby certify that I (we) have authorized _____ (and) _____
AGENT'S NAME(S) – *complete the second blank if more than one Agent*

to act on my (our) behalf and take all actions necessary to the processing, issuance, and acceptance of this permit and any and all standard and special conditions attached. I (we) hereby certify that the information submitted in this application is true and accurate to the best of my (our) knowledge.

Applicant's signature	Second applicant's signature, if applicable
Date 11/5/11	Date
Agent's signature and title JOHN KOSTON (AGENT) PRESIDENT CROSTON DIVING CORP.	Second agent's signature and title, if applicable
Date 11/5/11	Date

CONTRACTOR ACKNOWLEDGEMENT (IF APPLICABLE)

I (we), _____ (and) _____,
APPLICANT'S NAME(S) – *complete the second blank if more than one Applicant*

have contracted _____ (and) _____
CONTRACTOR'S NAME(S) – *complete the second blank if more than one Contractor*

to perform the work described in this Joint Permit Application, signed and dated _____.

I (we) will read and abide by all conditions as set forth in all Federal, State, and Local permits as required for this project. I (we) understand that failure to follow the conditions of the permits may constitute a violation of applicable Federal, State, and Local statutes and that we will be liable for any civil and/or criminal penalties imposed by these statutes.

In addition, I (we) agree to make available a copy of any permit to any regulatory representative visiting the project site to ensure permit compliance. If I (we) fail to provide the applicable permit upon request, I (we) understand that the representative will have the option of stopping our operation until it has been determined that we have a properly signed and executed permit and are in full compliance with all of the terms and conditions.

Contractor's name or name of firm (printed/typed) CROSTON DIVING CORPORATION	Contractor's or firm's mailing address	
Contractor's signature and title JOHN J. KOSTON PRESIDENT	Contractor's license number	Date
Applicant's signature JOHN J. KOSTON (AGENT)	Second applicant's signature, if applicable	
Date 11-5-11	Date	

END OF GENERAL INFORMATION

The following sections are activity-specific. Fill out only the sections that apply to your particular project.

20. NONTIDAL STREAM CHANNEL MODIFICATIONS (Continued)

Will low-flow channels be maintained in the modified stream channel? _____Yes _____No.
Describe how:

Will any structure(s) be placed in the stream to create riffles, pools, meanders, etc.? _____Yes _____No
If yes, please explain:

21. UTILITY CROSSINGS

Type of crossing: _____overhead __X__trenched __X__directionally-drilled

Method of clearing corridor of vegetation (check all that apply): __N/A__ mechanized land clearing that disturbs the soil surface
_____ cutting vegetation above the soil surface

Describe the materials to be used in the installation of the utility line (including gravel bedding for trenched installations, bentonite slurries used during direction-drilling, etc.) and a sequence of events to detail how the installation will be accomplished (including methods used for in-stream and dry crossings).

The upland entry point to 50' beyond MLW will be directional drilled utilizing bentonite for drill hole stabilization at both shorelines. HDPE conduit will be installed within these drilled areas and the fiber optic cable will be pulled through the conduits. Between shorelines the cable will be trenched into the bottom utilizing the jet assisted plow method.

For overhead crossings over navigable waterways (including all tidal waterways), please indicate the height of other overhead crossings or bridges over the waterway relative to mean high water, mean low water, or ordinary high water mark:

N/A

Nominal system voltage, if project involves power lines: _____N/A_____

Will there be an excess of excavated material? _____Yes __X__No
If so, describe the method that will be undertaken to dispose of, and transport, the material to its permanent disposal location and give that location:

Will any excess material be stockpiled in wetlands? _____Yes __X__No
If so, will the stockpiled material be placed on filter fabric or some other type of impervious surface? _____Yes _____No

21. UTILITY CROSSINGS (Continued)

Will permanent access roads be placed through wetlands/streams? ____Yes __X__No
If yes, will the roads be _____at grade or _____above grade (check one)?

Will the utility line through wetlands/waters be continually maintained (e.g. via mowing or herbicide)? ____Yes __X__No

If maintained, what is the maximum width? ____N/A____feet

22. ROAD CROSSINGS

Have you conducted hydraulic studies to verify the adequacy of the culverts? N/A Yes N/A No
If so, please attach a copy of the hydraulic study/report.
Virginia Department of Transportation (VDOT) standards require that the backwater for a 100 year storm not exceed 1 foot for all road, culvert, and bridge projects within FEMA-designated floodplains.

Will the culverts be countersunk below the stream bottom? _____Yes _____No. If no, explain: N/A

If the project entails a bridged crossing and there are similar crossings in the area, what is the vertical distance above mean high water, mean low water, or ordinary high water mark of those similar structures? _____N/A_____feet above _____
For all bridges proposed over navigable waterways (including all tidal water bodies), you will be required to contact the U.S. Coast Guard to determine if a permit is required of their agency.

On separate sheets of paper, describe the materials to be used, the method of construction (including the use of cofferdams), and the sequence of construction events. Include cross sections and profile plans of the culvert crossings including wing walls or rip rap.

23. PRIVATE AND COMMERCIAL AQUACULTURE ACTIVITIES

Please review VMRC regulations related to aquaculture activities if you are completing this section. An abbreviated application is available for certain private oyster gardening activities by a riparian owner. Also, separate information is required by the VMRC Fisheries Management Division for the review of commercial projects that may qualify for the Virginia Marine Resources Commission General Permit #4 FOR TEMPORARY PROTECTIVE ENCLOSURES FOR SHELLFISH. The VMRC aquaculture regulations can be found on the agency web page at: http://www.mrc.state.va.us/regulations/regindex.shtm.
Please see regulations 4 VAC 20-335-10 et seq., 4 VAC 20-336-10 et seq., and 4 VAC 20-1130-10 et seq.

Briefly describe your proposed aquaculture activity from the time of acquisition (seed, fingerlings, etc.) to time of harvest, and indicate which species you intend to culture. Attach additional sheets if needed.

N/A

Source of the animals/plants that you want to culture: N/A

Note: VMRC Regulation 4VAC 20-754 et seq. "Pertaining to the Importation of Fish, Shellfish or Crustacea" sets forth the requirements for importing organisms from out of state.

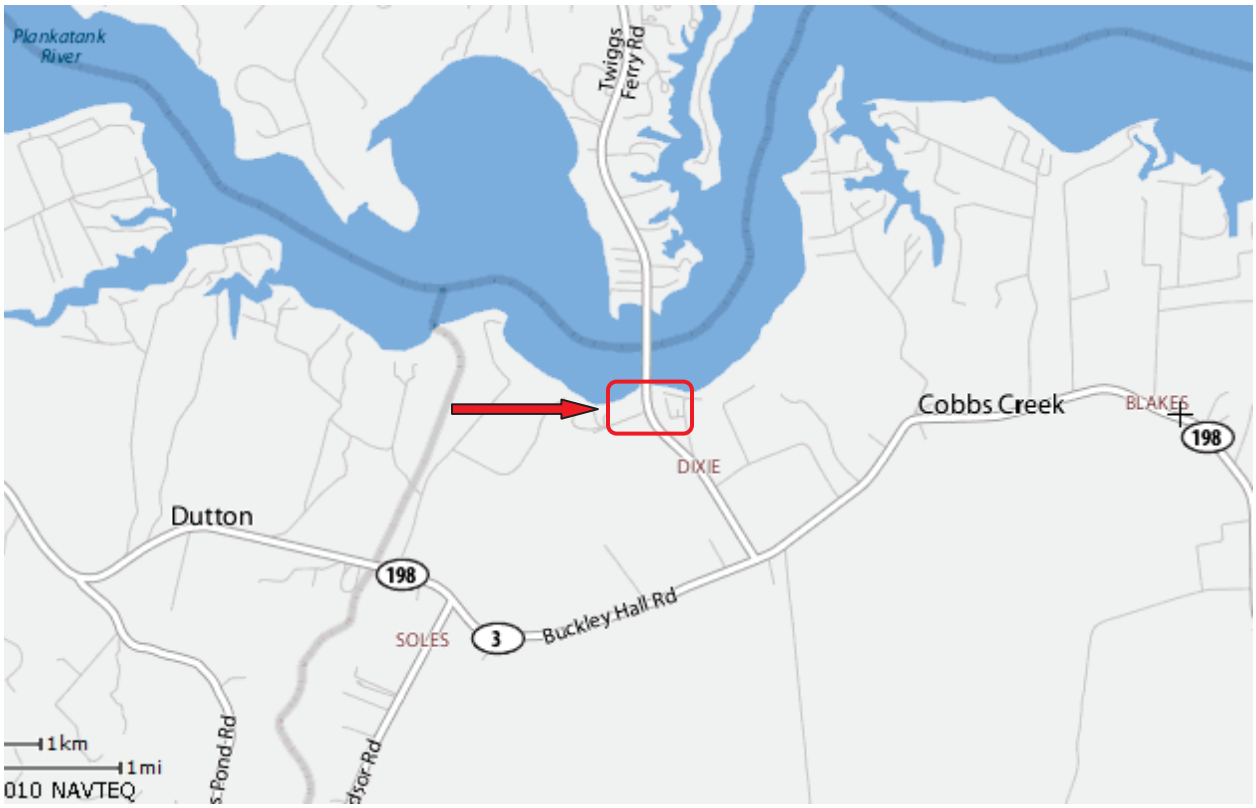
Describe below the number, type, and dimensions of the structures that will be used (e.g., 4' x 2' x 18" floats, 3' x 3' x 1' bottom cages, etc.) and the overall dimensions of the area to be occupied by the aquaculture structures (e.g., two 40-foot by 10-foot bottom plots).

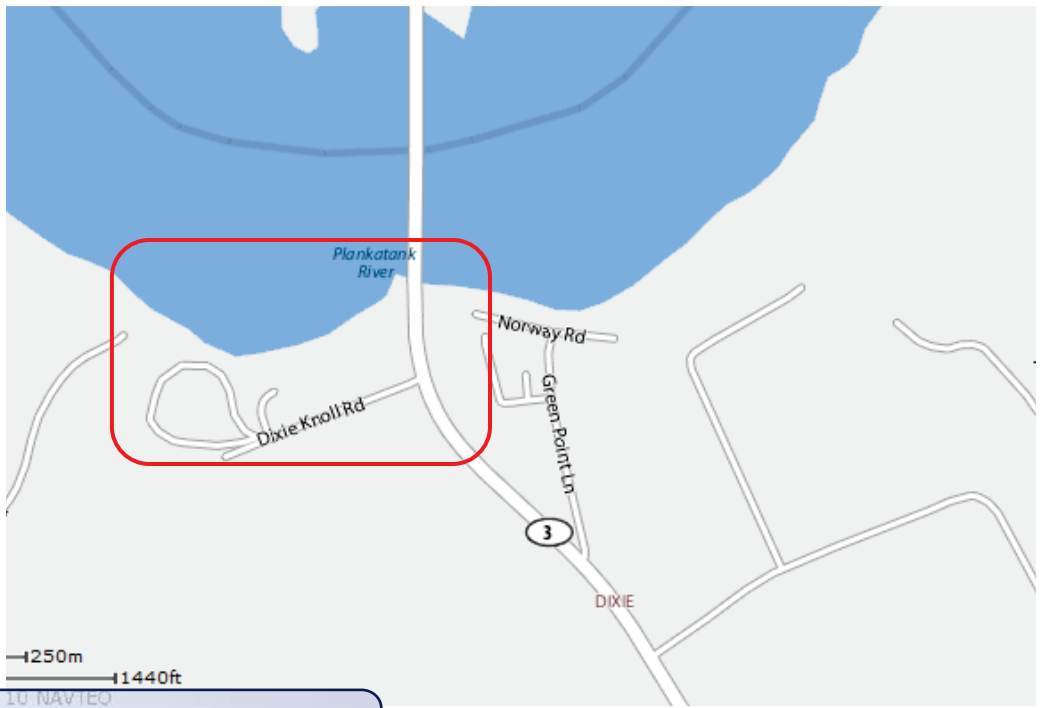
N/A

CROFTON Industries
Since 1949
16 Harper Ave - Portsmouth, VA 23707 (757) 397-1131 ph or (757) 397-8693 fax

Mathews County, VA Permit Application

Adjacent Property Owner Location Information Maps



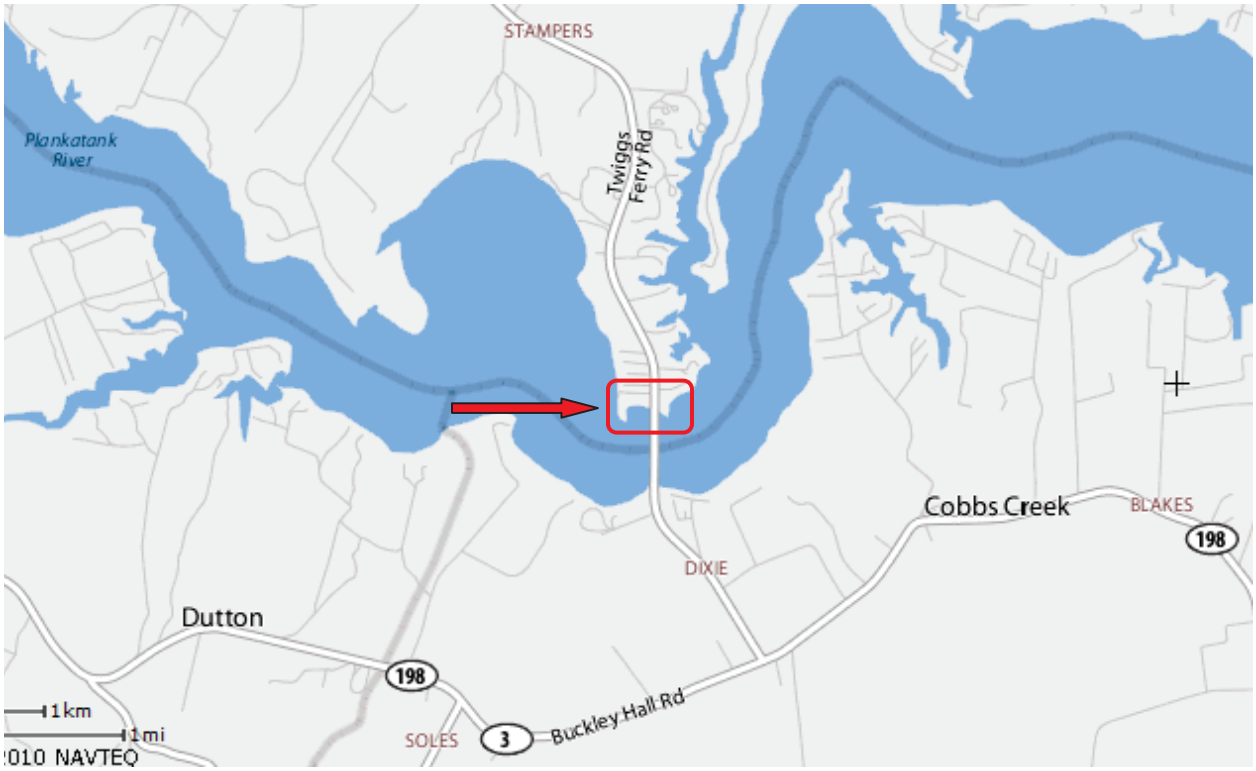


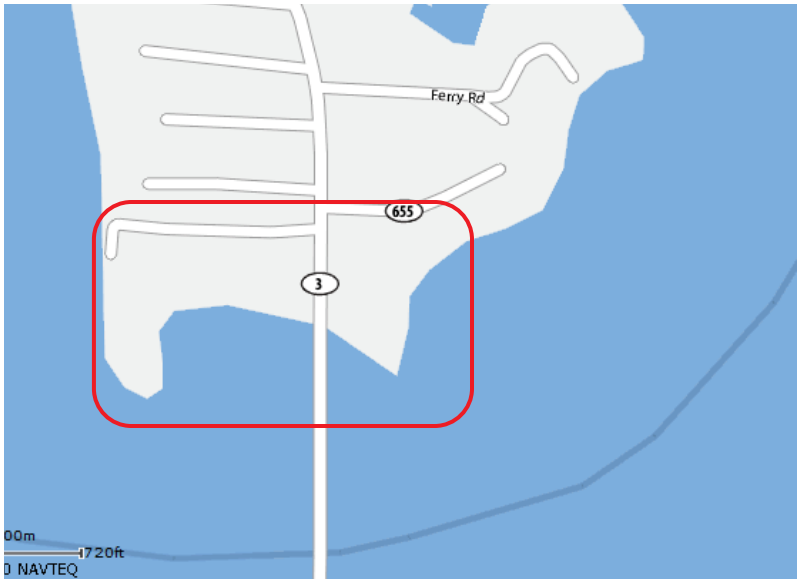
RECEIVED
By Virginia Marine Resources Commission at 1:00 pm, Nov 07, 2011

CROFTON Industries
Since 1949
16 Harper Ave - Portsmouth, VA 23707 (757) 397-1131 ph or (757) 397-8693 fax

Middlesex County, VA Permit Application

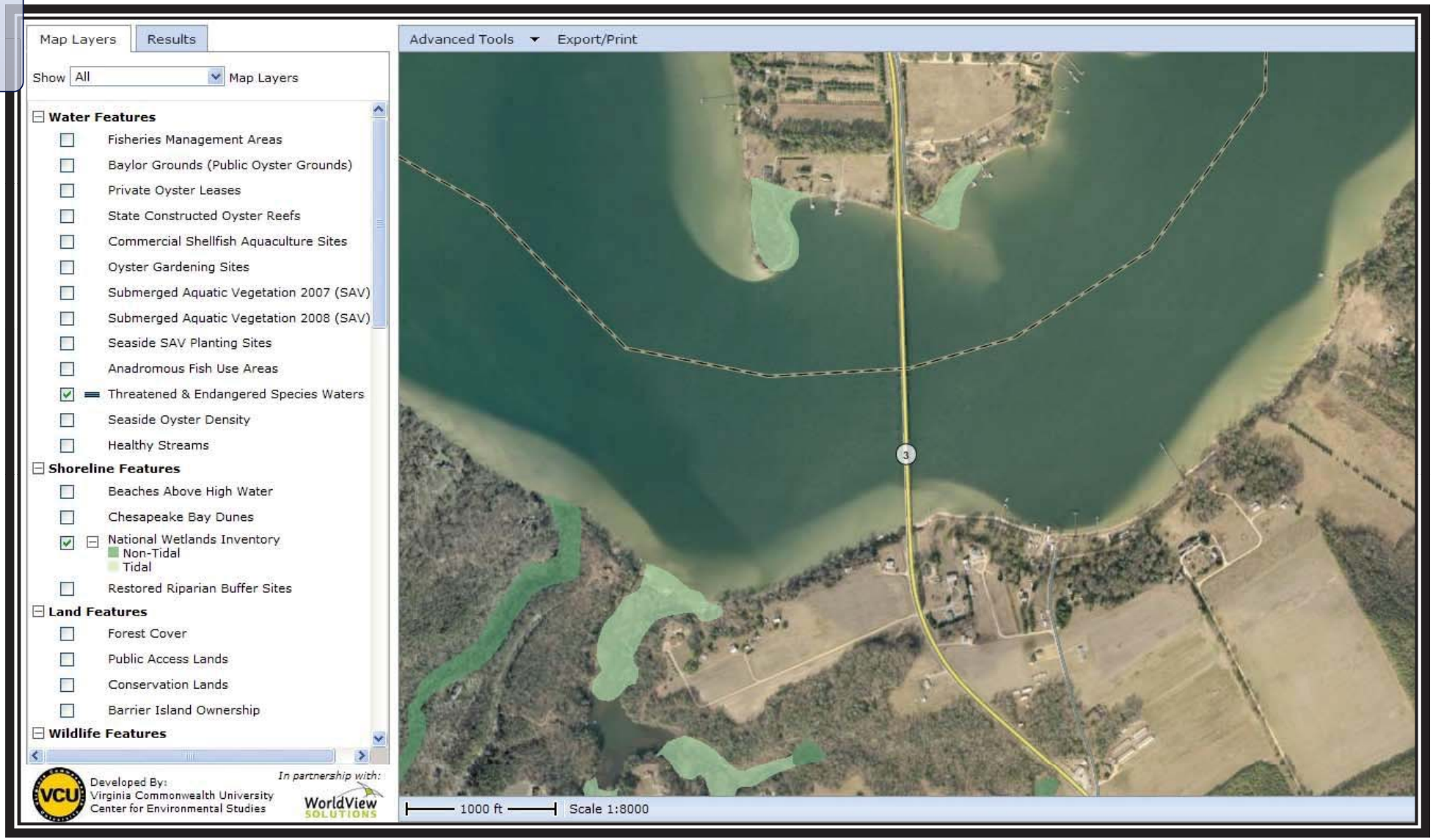
Adjacent Property Owner Location Information Maps





RECEIVED
By Virginia Marine Resources Commission at 1:00 pm, Nov 07, 2011

CROFTON Industries
Since 1949
16 Harper Ave - Portsmouth, VA 23707 (757) 397-1131 ph or (757) 397-8693 fax



CROFTON Industries

Design/Build Utility and Construction Projects Since 1949

GANS COMMUNICATIONS, L.P., DBA METROCAST COMMUNICATIONS
FIBER OPTIC SUBMARINE CABLE INSTALLATION
JOINT PERMIT APPLICATION
PROPOSAL DRAWINGS

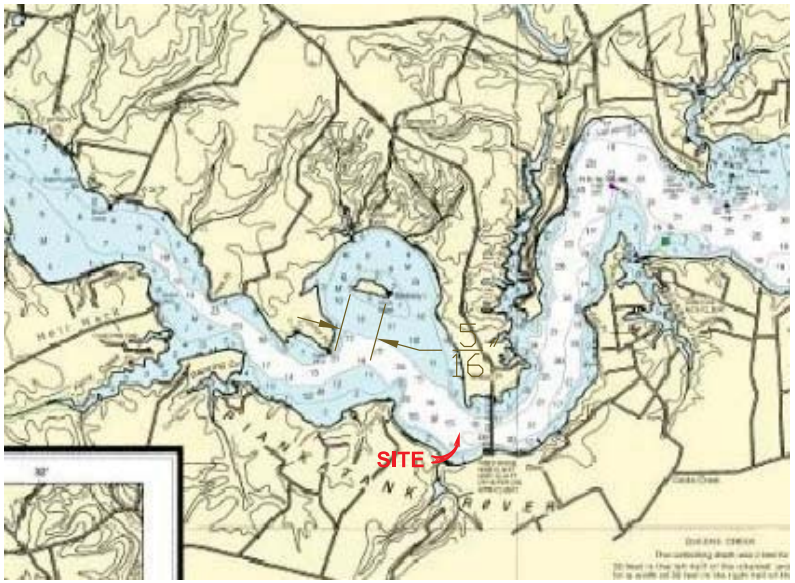
RECEIVED

By Virginia Marine Resources Commission at 1:01 pm, Nov 07, 2011

N

LOCATION MAP

SCALE: 1/4" = 10'-0"



N

AREA NOAA CHART

SCALE: 1/4" = 62'-0"

GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS

PROPOSED FIBER OPTIC SUBMARINE CABLE INSTALLATION

PIANKATANK RIVER, VA

INDEX TO DRAWINGS

SHEET NO.	DISCIPLINE NO.	TITLE
1	G001	COVER SHEET
2	C101	PLAN VIEW
3	C102	ELEV VIEW - SHEET 1
4	C103	ELEV VIEW - SHEET 2

RECEIVED

By Virginia Marine Resources Commission at 1:01 pm, Nov 07, 2011

DESIGNED BY: J.S. CROFTON
DRAWN BY: K.FEAIRHELLER
REVIEW BY: J.S. CROFTON
APPROVED BY: J.S. CROFTON
SIGN & DATE:

CROFTON Industries
Design/Build Utility and Construction Projects Since 1949

16 Harper Avenue
Portsmouth, Virginia 23707
Tele (757) 397-1131
Fax (757) 397-8693
www.croftondiving.com

CUSTOMER:
GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS

PROJECT TITLE:
GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS
PROPOSED FIBER OPTIC SUBMARINE CABLE INSTALLATION
PIANKATANK RIVER

COVER SHEET

JOB NO: YY-0000

CONTRACT NO: N/A

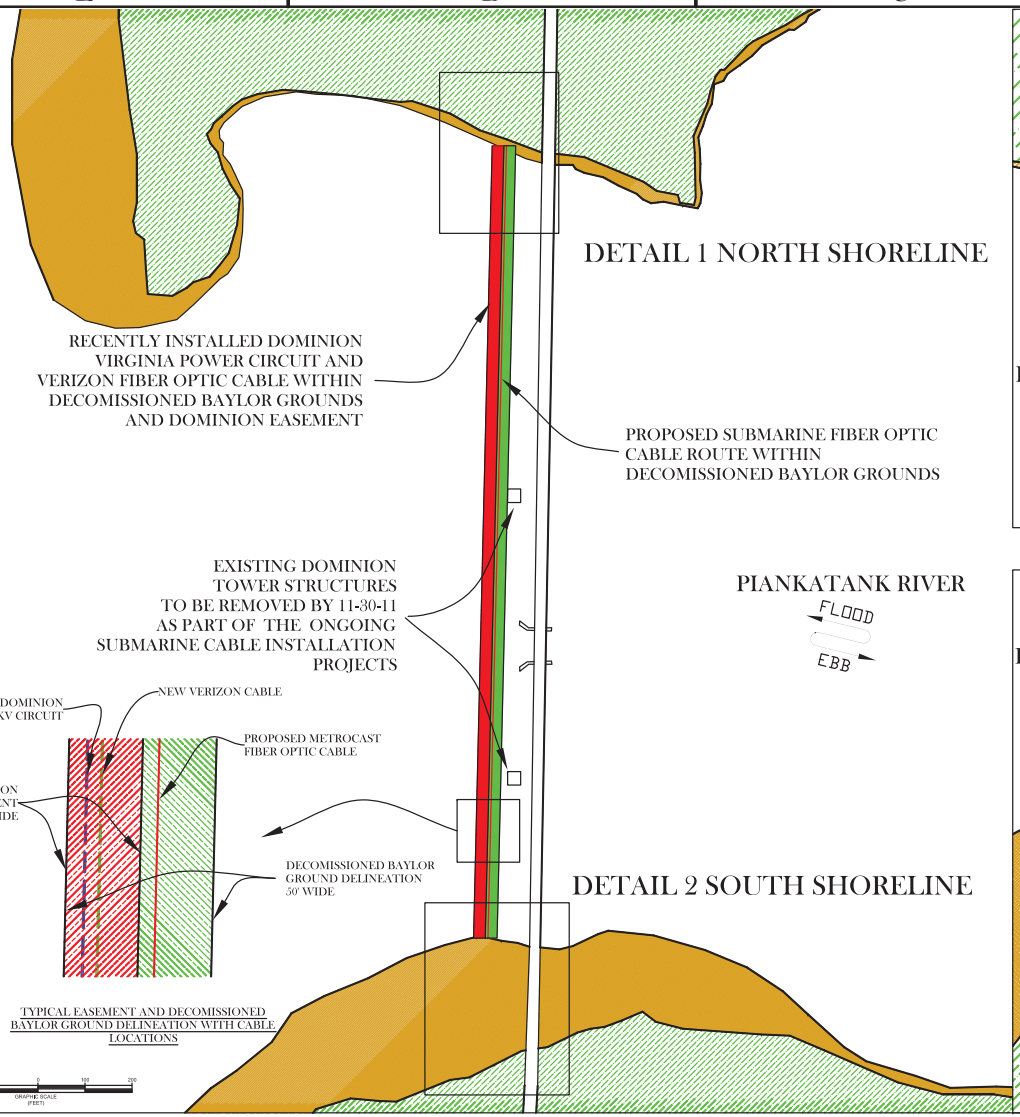
SCALE: AS NOTED

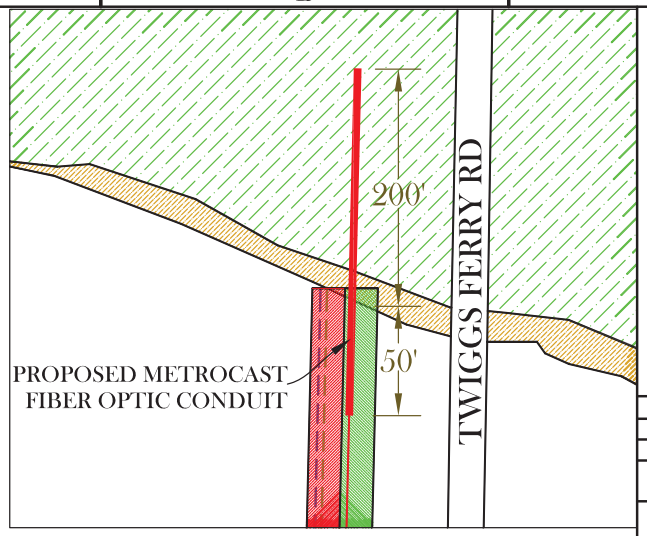
REV: A

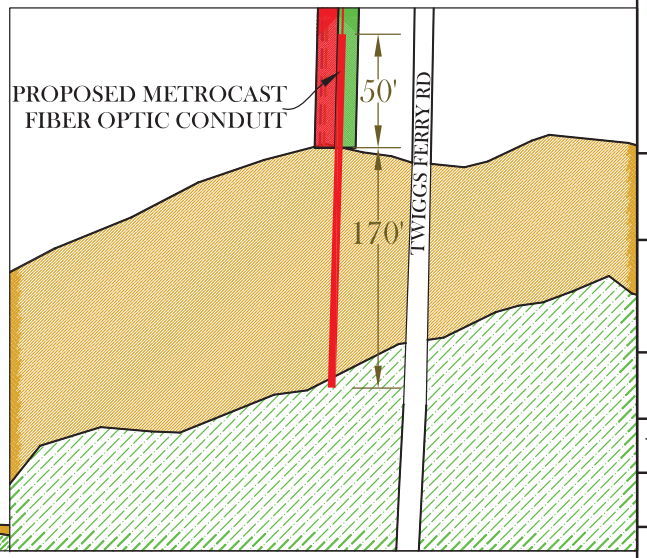
DWG SIZE: B

DATE: 11/2/11

SHEET: G001







PROJECT PLAN VIEW
SCALE: NOTED

N

DESIGNED BY: J.S. CROFTON
DRAWN BY: K.FEAIRHELLER
REVIEW BY: J.S. CROFTON
APPROVED BY: J.S. CROFTON
SIGN & DATE:

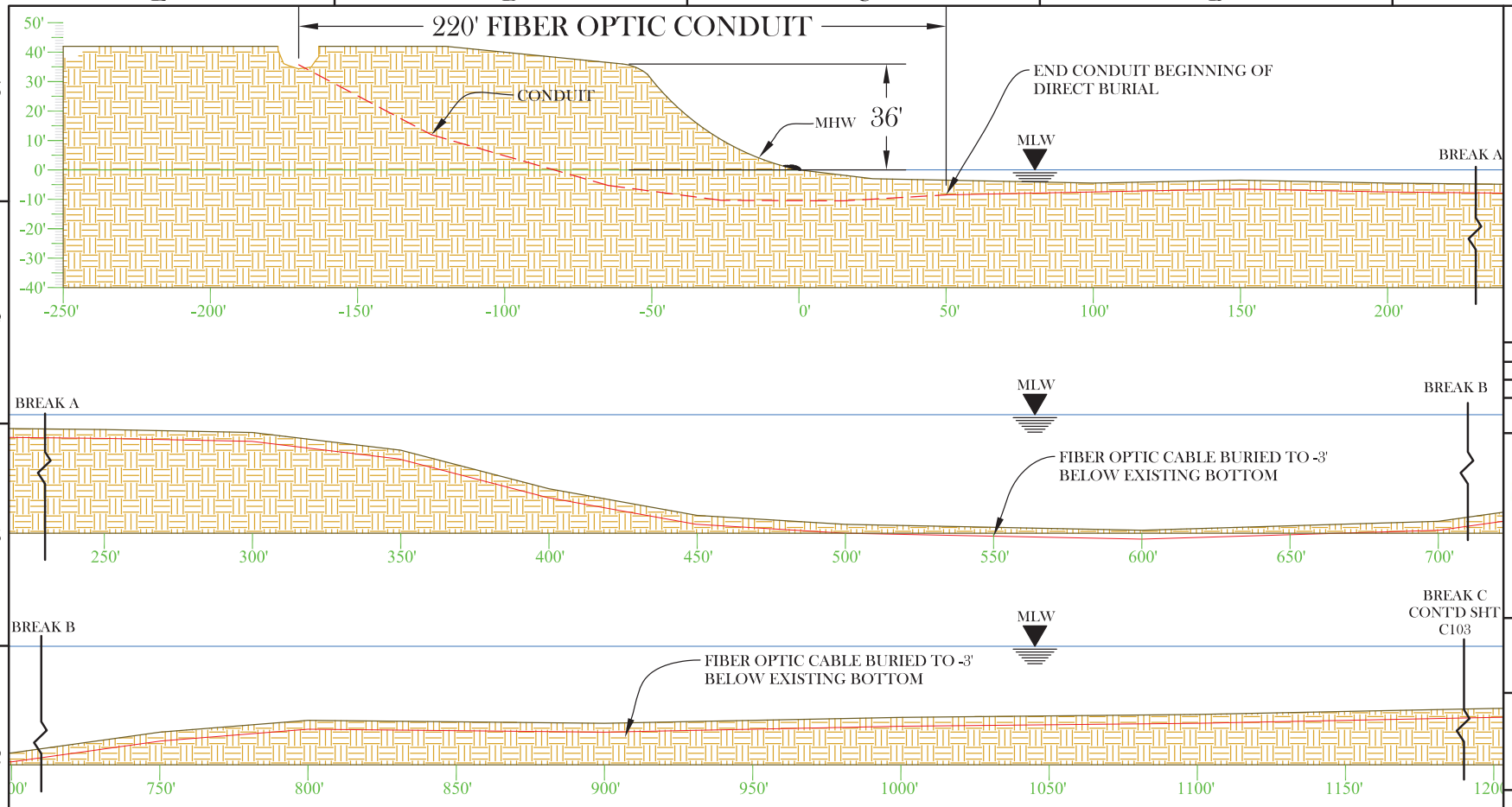
CROFTON Industries
Design/Build Utility and Construction Projects Since 1949
16 Harper Avenue
Portsmouth, Virginia 23707
Tele (757) 397-1131
Fax (757) 397-8693
www.croftondiving.com

CUSTOMER:
GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS

PROJECT TITLE:
GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS
PROPOSED FIBER OPTIC SUBMARINE CABLE INSTALLATION
PIANKATANK RIVER

PLAN VIEW

JOB NO: YY-0000
CONTRACT NO: N/A
SCALE: NOTED
REV: A
DWG SIZE: B
DATE: 11/2/11
SHEET: C101



PROJECT ELEVATION VIEW

N

= MLW

= GRADE/NATURAL BOTTOM

RECEIVED
By Virginia Marine Resources Commission at 1:02 pm, Nov 07, 2011

DESIGNED BY: J.S. CROFTON
DRAWN BY: K.FEAIRHELLER
REVIEW BY: J.S. CROFTON
APPROVED BY: J.S. CROFTON
SIGN & DATE:

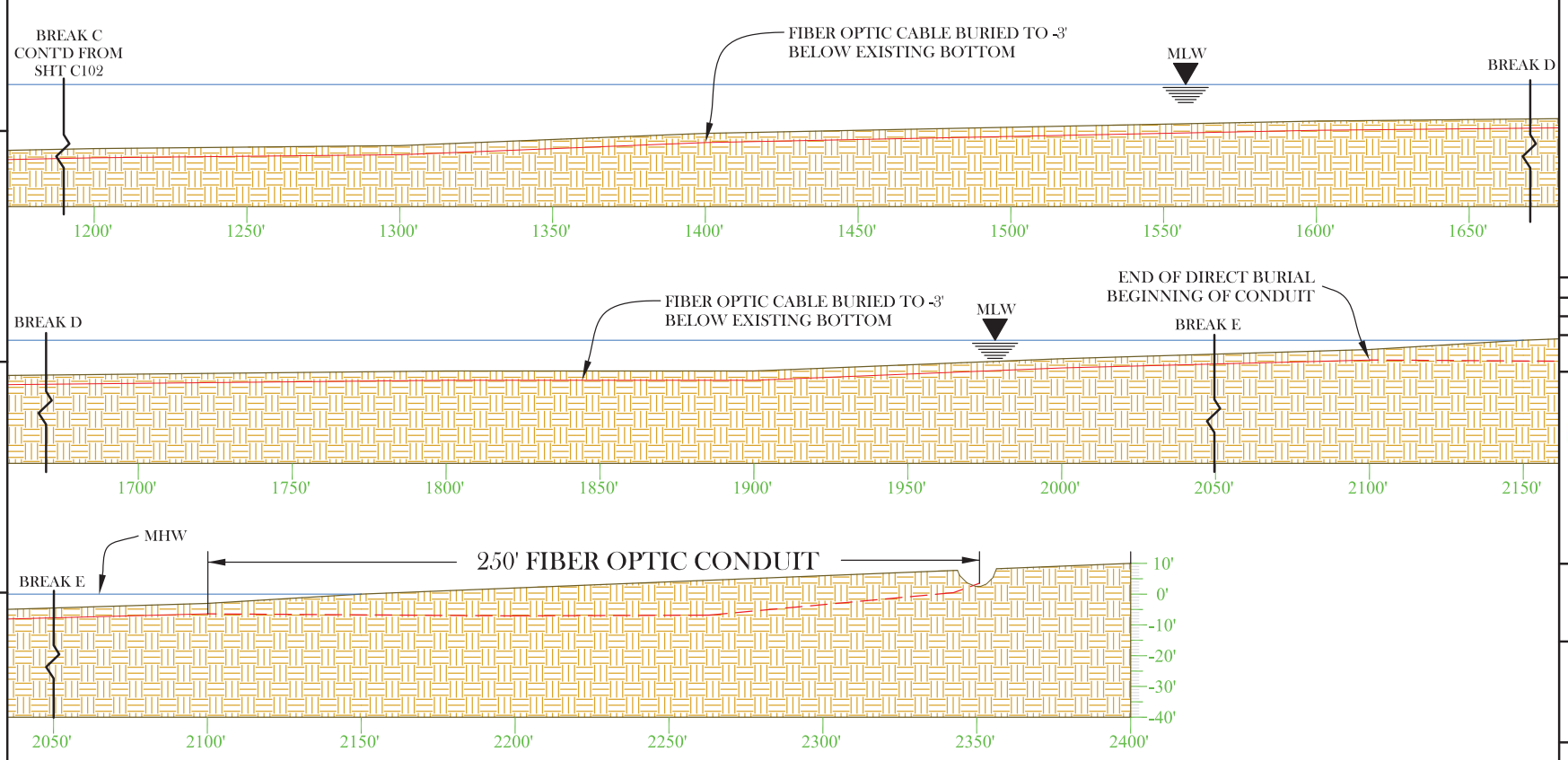
CROFTON Industries
Design/Build Utility and Construction Projects Since 1949
16 Harper Avenue
Portsmouth, Virginia 23707
Tele (757) 397-1131
Fax (757) 397-8693
www.croftondiving.com

CUSTOMER:
GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS

PROJECT TITLE:
GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS
PROPOSED FIBER OPTIC SUBMARINE CABLE INSTALLATION
PIANKATANK RIVER

ELEVATION VIEW

JOB NO: YY-0000
CONTRACT NO: N/A
SCALE: NOTED
REV: A
DWG SIZE: B
DATE: 11/2/11
SHEET: C102



PROJECT ELEVATION VIEW

N

= MLW

= GRADE/NATURAL BOTTOM

RECEIVED
By Virginia Marine Resources Commission at 1:02 pm, Nov 07, 2011

DESIGNED BY: J.S. CROFTON
DRAWN BY: K.FEAIRHELLER
REVIEW BY: J.S. CROFTON
APPROVED BY: J.S. CROFTON
SIGN & DATE:

CROFTON Industries
Design/Build Utility and Construction Projects Since 1949
16 Harper Avenue
Portsmouth, Virginia 23707
Tele (757) 397-1131
Fax (757) 397-8693
www.croftondiving.com

CUSTOMER:
GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS

PROJECT TITLE:
GANS COMMUNICATIONS, L.P., dba METROCAST COMMUNICATIONS
PROPOSED FIBER OPTIC SUBMARINE CABLE INSTALLATION
PIANKATANK RIVER

ELEVATION VIEW
SHEET 2

JOB NO: YY-0000
CONTRACT NO: N/A
SCALE: NOTED
REV: A
DWG SIZE: B
DATE: 11/2/11
SHEET: C103

CROFTON Industries

Design/Build Utility and Construction Projects Since 1949

GANS COMMUNICATIONS, L.P., DBA METROCAST COMMUNICATIONS
FIBER OPTIC SUBMARINE CABLE INSTALLATION
JOINT PERMIT APPLICATION
PHOTOGRAPHIC LOG

RECEIVED

By Virginia Marine Resources Commission at 1:02 pm, Nov 07, 2011

PROPOSED CABLE NORTH SHORELINE INTERSECT

PROPOSED CABLE SOUTH SHORELINE INTERSECT

CROFTON Industries
Design/Build Utility and Construction Projects Since 1949

HYDROGRAPHIC SURVEY INVESTIGATION

SIDE SCAN SONAR INVESTIGATION

CROFTON Industries
Design/Build Utility and Construction Projects Since 1949

DIVER INVESTIGATION

CROFTON Industries
Design/Build Utility and Construction Projects Since 1949

CROFTON Industries

Design/Build Utility and Construction Projects Since 1949

GANS COMMUNICATIONS, L.P., DBA METROCAST COMMUNICATIONS
FIBER OPTIC SUBMARINE CABLE INSTALLATION
JOINT PERMIT APPLICATION
ADJACENT PROPERTY INFORMATION

CROFTON
Diving Corporation
SINCE 1949

16 Harper Avenue · P.O. Box 7756 · Portsmouth, VA 23707 · 757-397-1131 (24 hours) · Fax 757-397-8693

November 2, 2011

ADJACENT PROPERTY OWNER
NAMES & ADDRESSES

MIDDLESEX COUNTY

William & Janet Lundin
1466 River Run Drive
Hartfield, VA 23071

Allie & Carolyn Walton
65 Drum Point Lane
Hartfiled, VA 23071

Mildred Shackleford
PO Box 361
Urbanna, VA 23175

Larry Dorsey & Marty Dorsey
63 Pipe-N-Tree Drive
Hartfield, VA 23071

Wilbur Brown Sibley
100 Ferry Road
Hartfield, VA 23071

Glen Kirby & Julie Krug
102 Ferry Road
Hartfield, VA 23071

VDOT
Saluda Residency
Attn: Mr. Shawn Trapani
1027 General Puller Highway
Saluda, VA 23149

MATHEWS COUNTY

Benjamin Keith Trammell
154 Twiggs Ferry Road
Dutton, VA 23050

Carrol Trammell
PO Box 1764
Gloucester, VA 23061

E. Kent & B. Keith Trammell
154 Twiggs Ferry Road
Dutton, VA 23050

CROFTON
Diving Corporation
SINCE 1949

16 Harper Avenue · P.O. Box 7756 · Portsmouth, VA 23707 · 757-397-1131 (24 hours) · Fax 757-397-8693

November 2, 2011

Mr. Glen W. Kirby and Mrs. Julie L. Krug
102 Ferry Road
Hartfield, VA 23071

Subject: Gans Communications, L.P., dba MetroCast Communications
Piankatank River,
Middlesex to Mathews County,
Proposed Fiber Optic Cable Installation Project

Topic: Adjacent Property Owner Notification

Ladies and Gentlemen,

Gans Communications, L.P., dba MetroCast Communications, in an ongoing effort to provide reliable, quality communication service to the area is applying for a permit to install a fiber optic cable across the Piankatank River along a route virtually identical to those recently installed for Dominion Virginia Power and Verizon. Please find enclosed drawings applicable to the proposed project in which we are applying for the installation of a new fiber optic cable crossing the Piankatank River parallel to the Route 3 Bridge between Middlesex and Mathews Counties.

The work process to conduct these operations is very low in impact with regards to the environment and property. The work will be initiated by way of directional bore operations from the upland terminal site, down the bank and into the waterway to a location approximately 50' beyond the mean low water line. There will be no excavation on the bank that will disrupt vegetation or any other structures throughout the cable route. This directional bore operation will be completed by way of pulling in a conduit which will allow for the feeding of the fiber optic cable from the water to the termination structure on land on both sides of the river.

With completion of the directional boring operations (Horizontal Directional Drilling (HDD)), our personnel will mobilize to the site with floating crane barges with the cable on board the floating plant. With completion of all routing information conducted and notice to mariners for public safety, the cable will be pulled into the conduit on the south side of the river, embedment plowing will be conducted to embed the cable

approximately 3’ into the substrate across the waterway and then the cable will be placed in the conduit on the opposite side of the river.

The embedment plowing impact is very minimal and temporary in nature and during the course of the work, an approximate 6” wide trench will be formed with the cable simultaneously being embedded into this trench with immediate infilling of the trench leaving little evidence of work in the area.

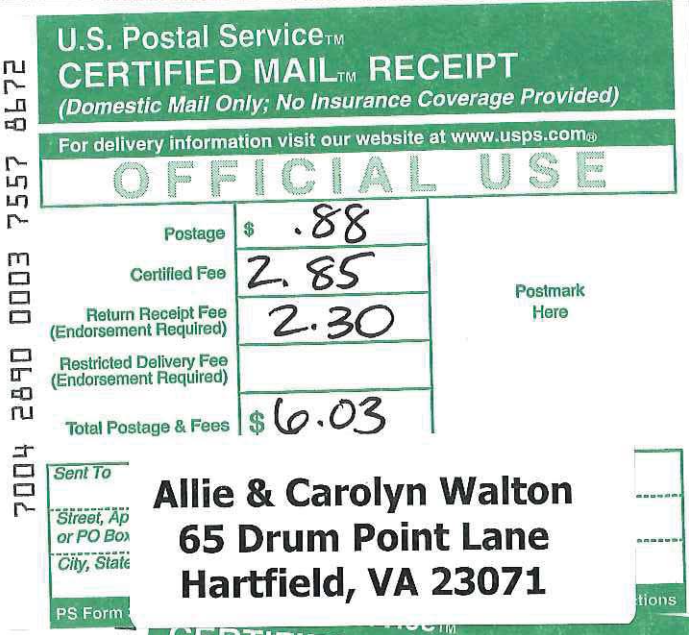
The upland work as discussed will be the installation of the conduit by way of directional boring. The directional boring equipment will be set up at each terminal site and after the conduit is pulled into position the equipment will be demobilized off the site and the upland site will have only minimal impact. Of course at the end of the project, all seeding and strawing will be conducted in the construction area to bring the area back to its natural condition.

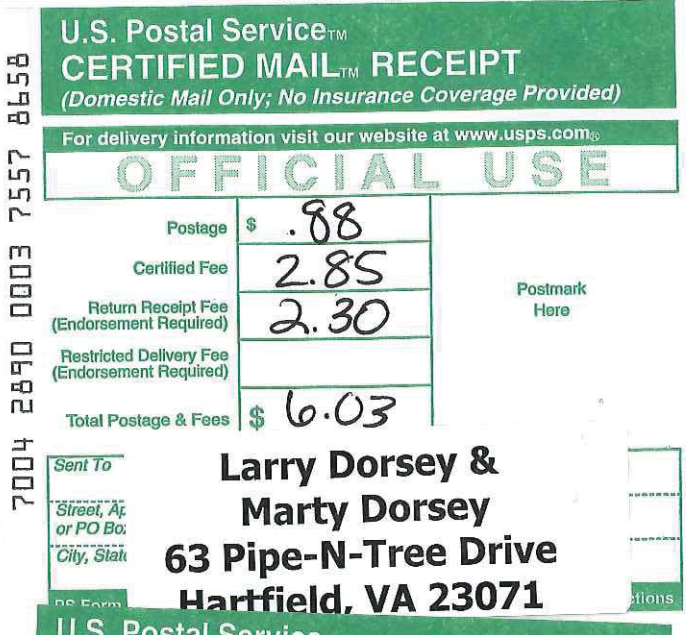
I hope that this information meets with your approval and should you have any questions please contact me at my office and I would also be glad to come and talk with you at any time on the job site during the course of the application review process.

Thank you for your attention to this critical and strategic crossing across the Piankatank River for the residences throughout this area and I remain,

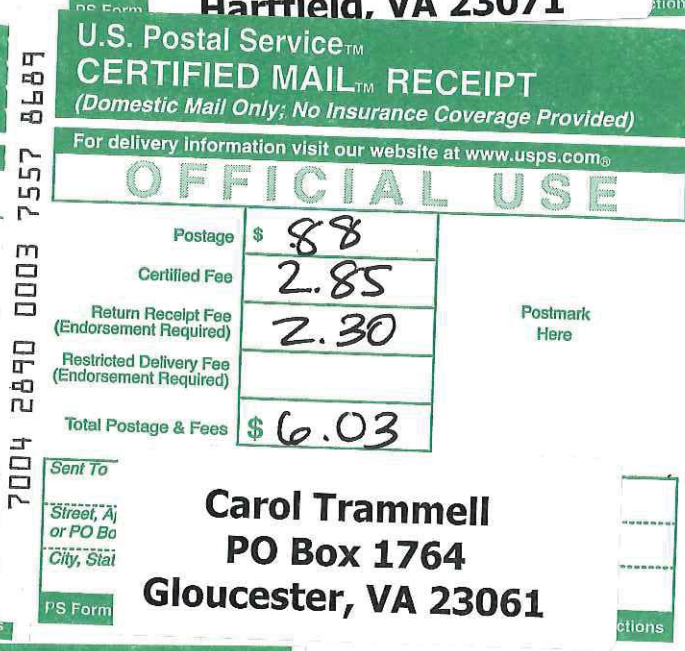
Sincerely yours,

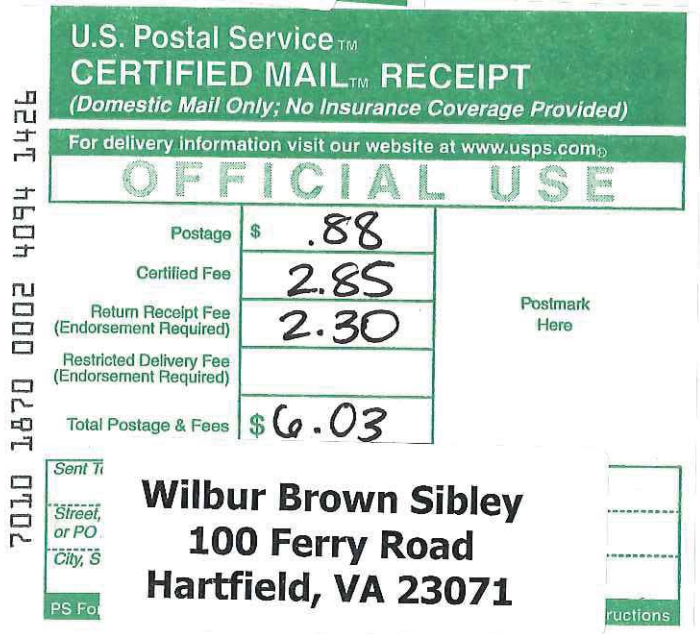
Juan S. Crofton
Crofton Diving Corporation

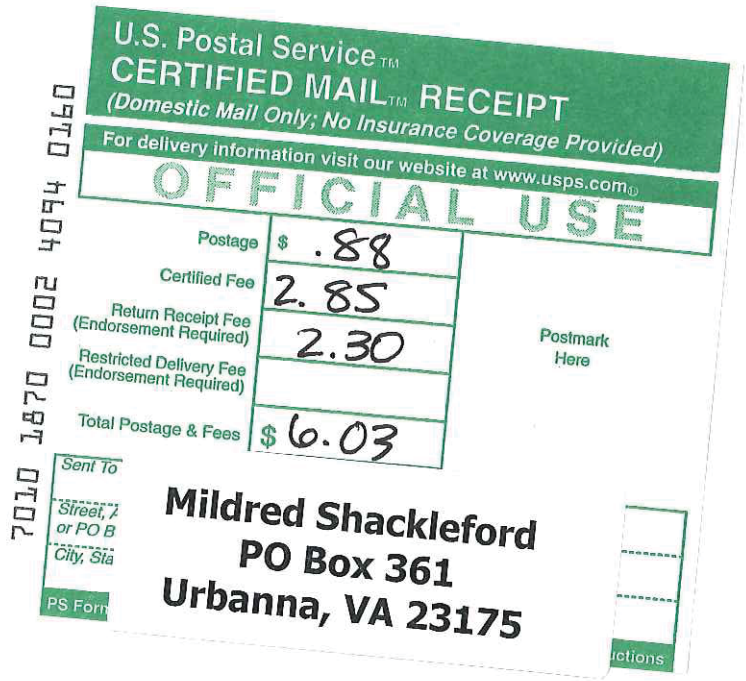

7004 2890 0003 7557 8672
U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE
Postage $ .88
Certified Fee 2.85
Return Receipt Fee (Endorsement Required) 2.30
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $ 6.03
Postmark Here
Sent To
Allie & Carolyn Walton
65 Drum Point Lane
Hartfield, VA 23071


7004 2890 0003 7557 8658
U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE
Postage $ .88
Certified Fee 2.85
Return Receipt Fee (Endorsement Required) 2.30
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $ 6.03
Postmark Here
Sent To
Larry Dorsey &
Marty Dorsey
63 Pipe-N-Tree Drive
Hartfield, VA 23071


7004 2890 0003 7557 8689
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE
Postage $ .88
Certified Fee 2.85
Return Receipt Fee (Endorsement Required) 2.30
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $ 6.03
Postmark Here
Sent To
Benjamin K. Trammell
154 Twiggs Ferry Road
Dutton, VA 23050


7004 2890 0003 7557 8689
U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE
Postage $ .88
Certified Fee 2.85
Return Receipt Fee (Endorsement Required) 2.30
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $ 6.03
Postmark Here
Sent To
Carol Trammell
PO Box 1764
Gloucester, VA 23061


7010 1870 0002 4094 1426
U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE
Postage $ .88
Certified Fee 2.85
Return Receipt Fee (Endorsement Required) 2.30
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $ 6.03
Postmark Here
Wilbur Brown Sibley
100 Ferry Road
Hartfield, VA 23071



U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .88
Certified Fee	2.85
Return Receipt Fee (Endorsement Required)	2.30
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.03

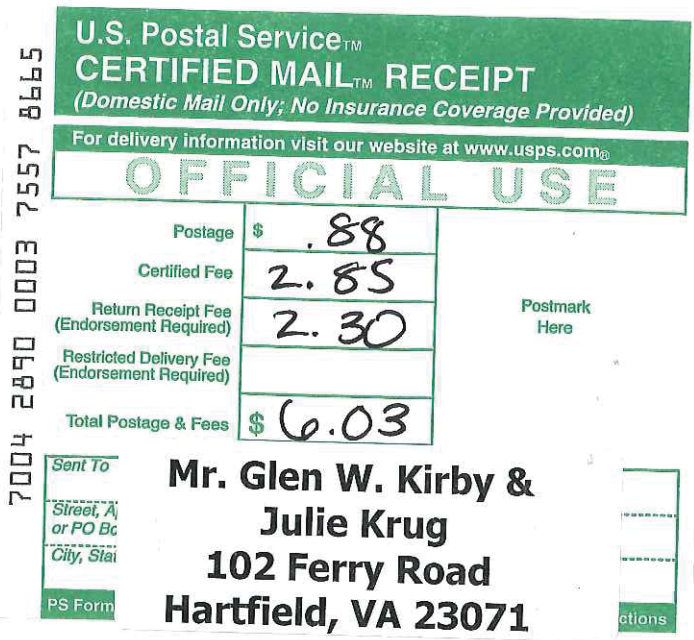
Postmark Here

Sent To
Street, Apt. No. or PO Box No.
City, State, ZIP+4

Mildred Shackleford
PO Box 361
Urbanna, VA 23175

PS Form 3800

7010 1870 0002 4094 0160



U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .88
Certified Fee	2.85
Return Receipt Fee (Endorsement Required)	2.30
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.03

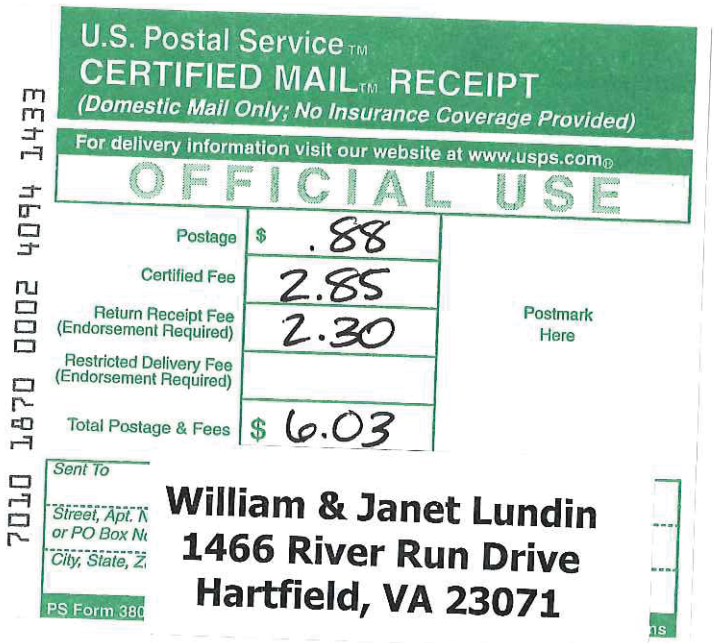
Postmark Here

Sent To
Street, Apt. No. or PO Box No.
City, State, ZIP+4

Mr. Glen W. Kirby &
Julie Krug
102 Ferry Road
Hartfield, VA 23071

PS Form 3800

7004 2890 0003 7557 8665



U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .88
Certified Fee	2.85
Return Receipt Fee (Endorsement Required)	2.30
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.03

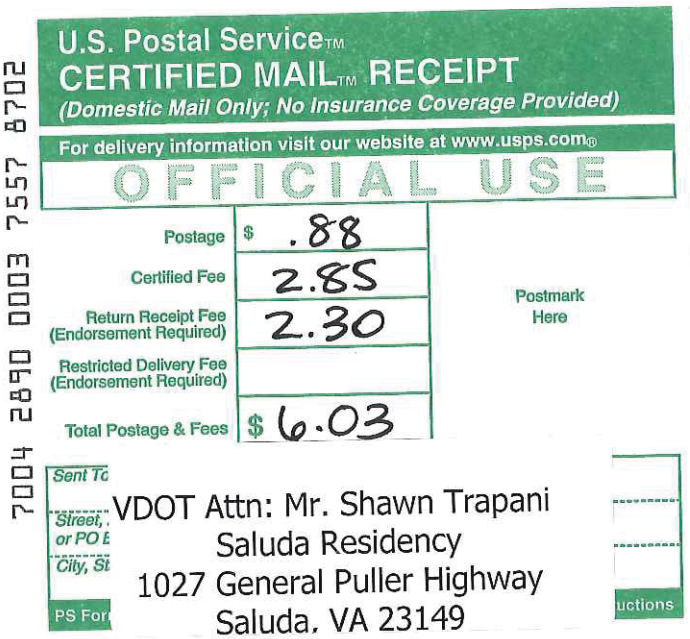
Postmark Here

Sent To
Street, Apt. No. or PO Box No.
City, State, ZIP+4

William & Janet Lundin
1466 River Run Drive
Hartfield, VA 23071

PS Form 3800

7010 1870 0002 4094 1433



U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com®
OFFICIAL USE

Postage	$ .88
Certified Fee	2.85
Return Receipt Fee (Endorsement Required)	2.30
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$ 6.03

Postmark Here

Sent To
Street, Apt. No. or PO Box No.
City, State, ZIP+4

VDOT Attn: Mr. Shawn Trapani
Saluda Residency
1027 General Puller Highway
Saluda, VA 23149

PS Form 3800

7004 2890 0003 7557 8702

Virginia Marine Resources Commission
Permit Application 20111642
Printed: Friday January 10, 2020 11:13 AM

Applicant: Gans Communications, L.P.
Post Office Box 1147
Saluda, VA 23149

Application Number:	20111642	**Engineer:**	Jay Woodward
Application Date:	November 7, 2011	**Locality:**	Middlesex
Permit Type:	VMRC Subaqueous	**Waterway:**	Piankatank River
Permit Status:	Issued	**Expiration Date:**	December 31, 2014
Wetlands Board Action:	No Permit Required	**Public Hearing Date:**	

Project Description: Piankatank River Submarine Fiber Optic Cable Insta

Project Dimensions:

Subaqueous Crossing: 2100 Linear Feet

Virginia Marine Resources Commission
Photos for Permit Application 20111642
Printed: Friday January 10, 2020 11:13 AM

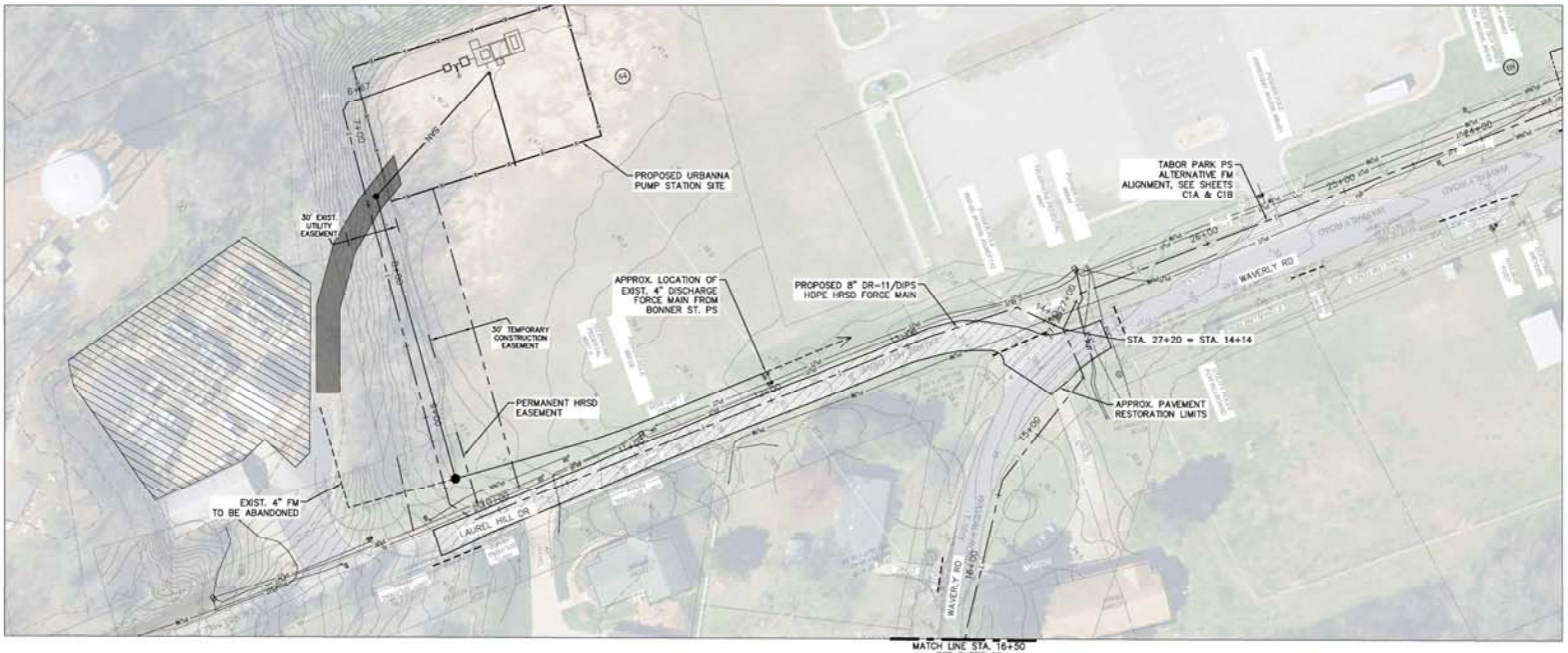
Date Photo Taken: 2011:10:18 13:41:48

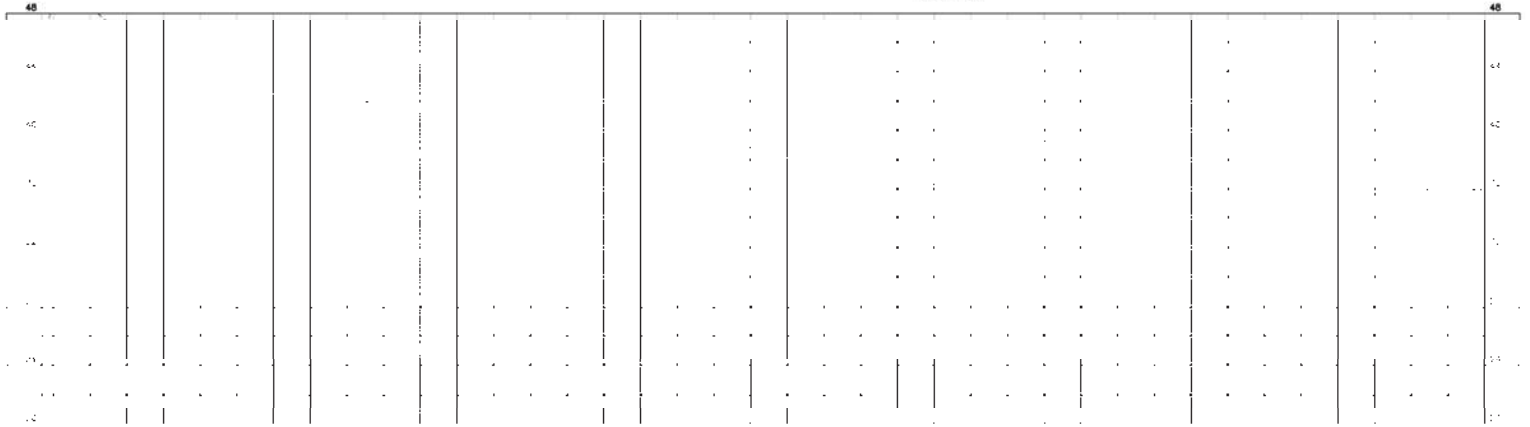
Date Photo Taken: 2011:10:18 13:42:14

Virginia Marine Resources Commission
Photos for Permit Application 20111642
Printed: Friday January 10, 2020 11:13 AM

Date Photo Taken: 2011:10:18 13:42:25

Appendix C: Preliminary Force Main Plans





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

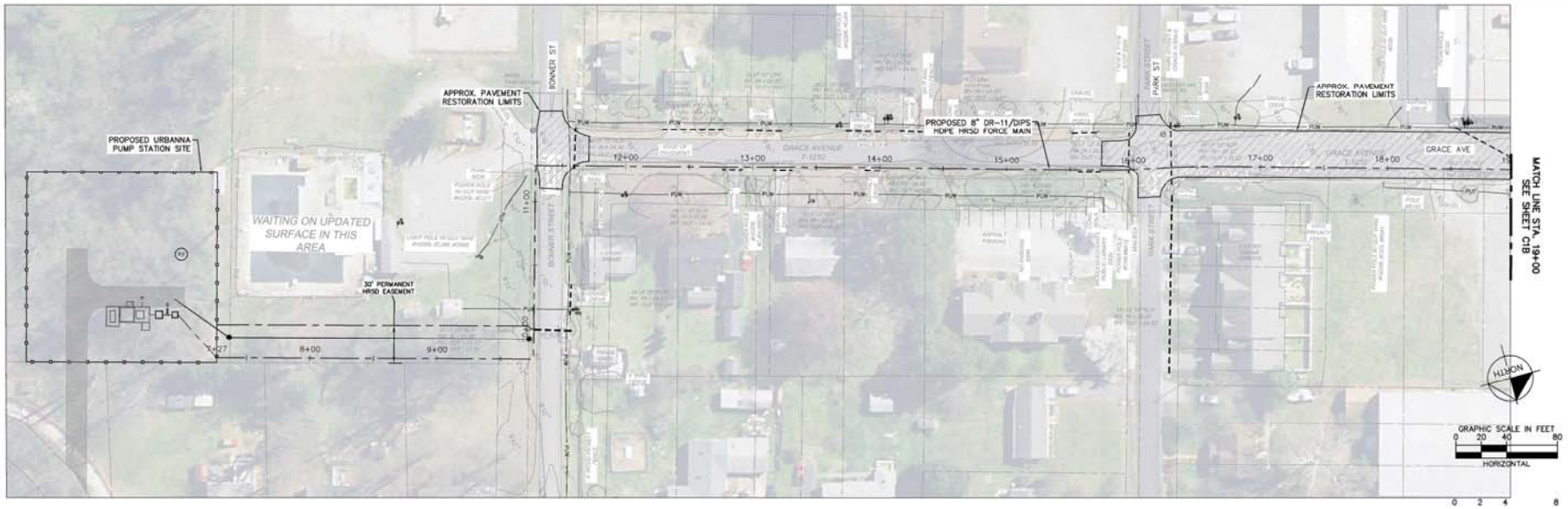
NO.	DATE	BY	REVISION

FM Plan and Profile (6+67 - 16+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C1
SCALE:	1" = 40'	SHEET NO.:	1 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

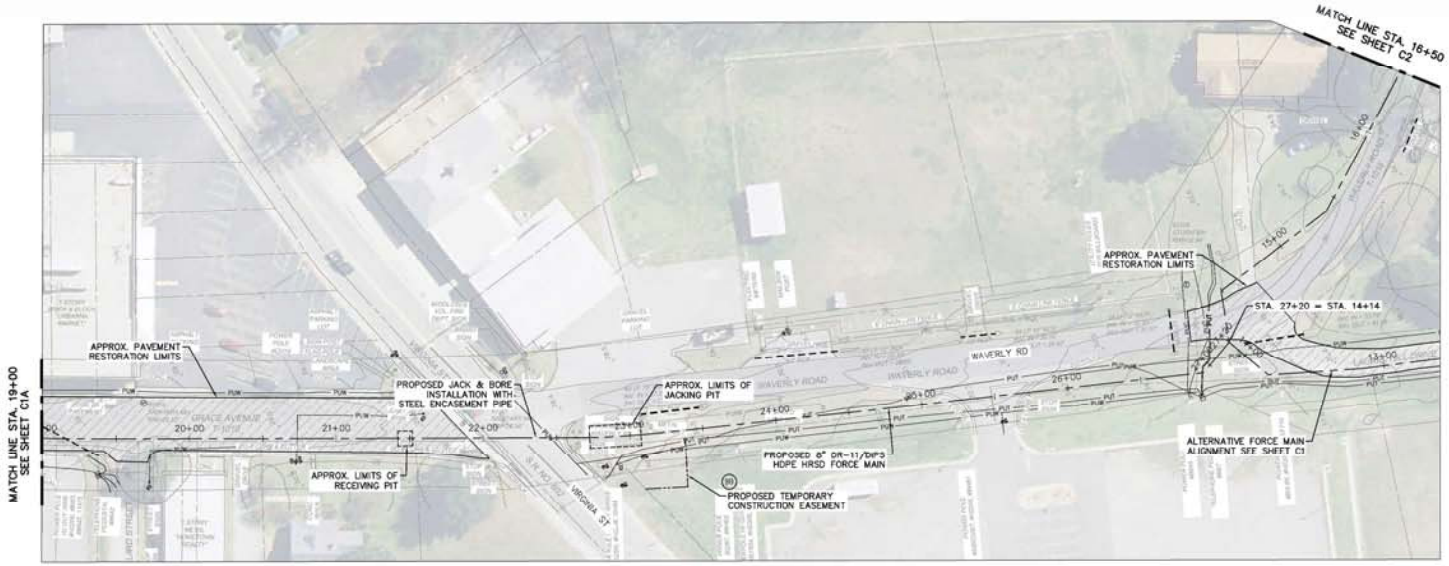
NO.	DATE	BY	REVISION

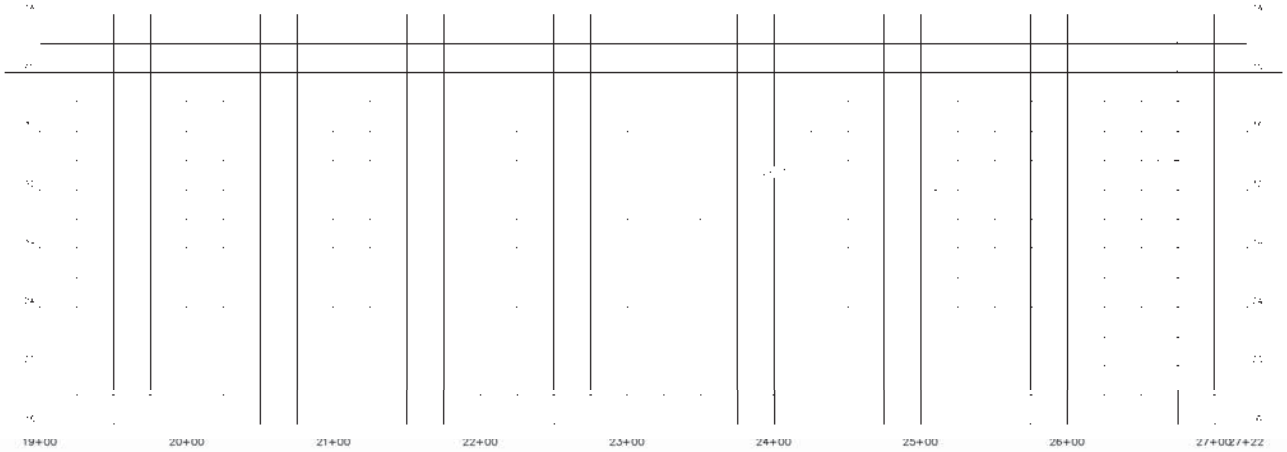
Tabor Park PS
Alternative FM Alignment
Plan and Profile (7+27 - 19+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Intercepter System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C1A
SCALE:	1" = 40'	SHEET NO.:	2 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

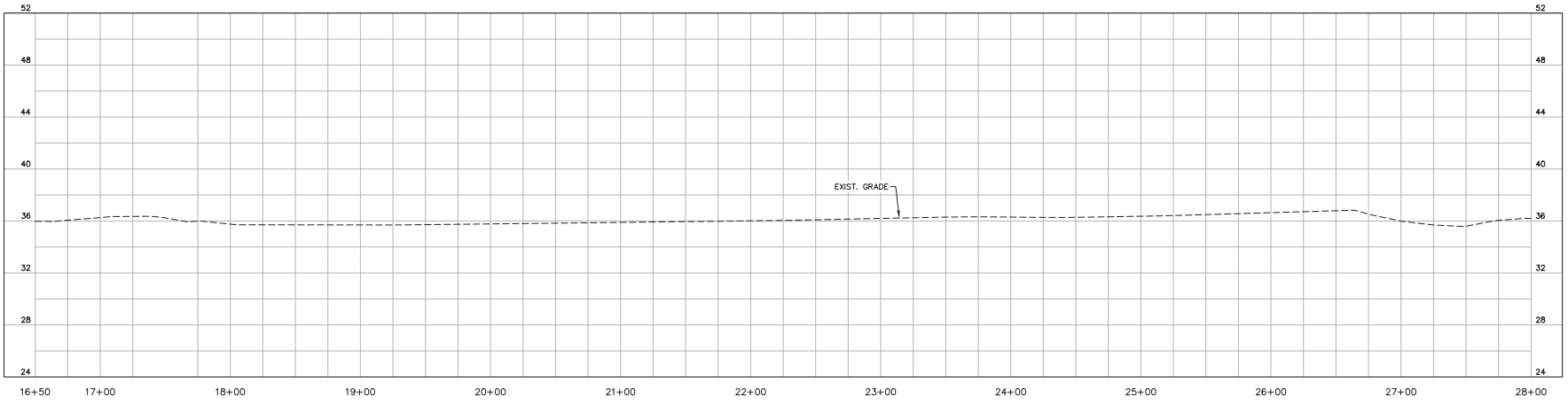
NO.	DATE	BY	REVISION

Tabor Park PS
Alternative FM Alignment
Plan and Profile (19+00 - 27+22)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C1B
SCALE:	1" = 40'	SHEET NO.:	3 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

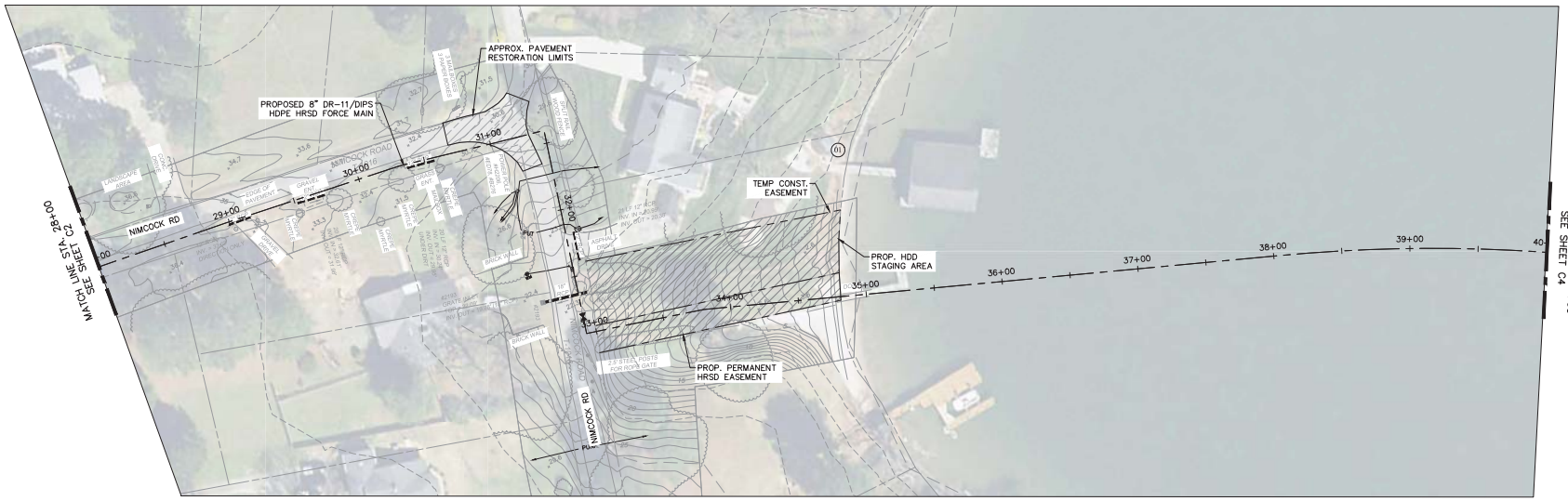
NO.	DATE	BY	REVISION

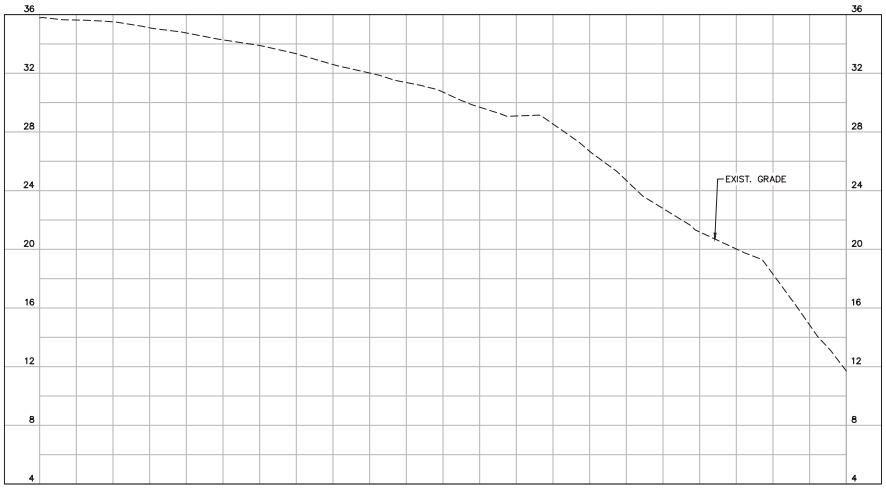
FM Plan and Profile (16+50 - 28+00)

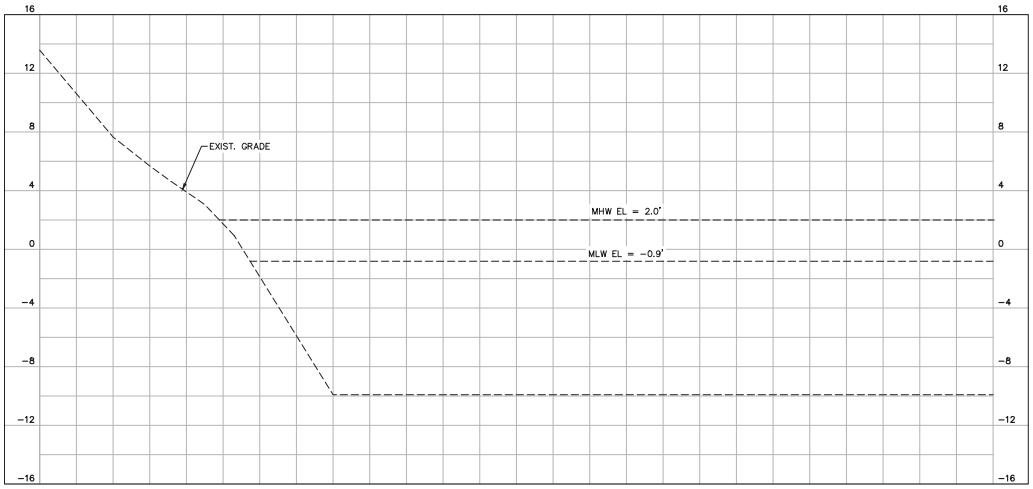
HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C2
SCALE:	1" = 40'	SHEET NO.:	4 of 77







30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

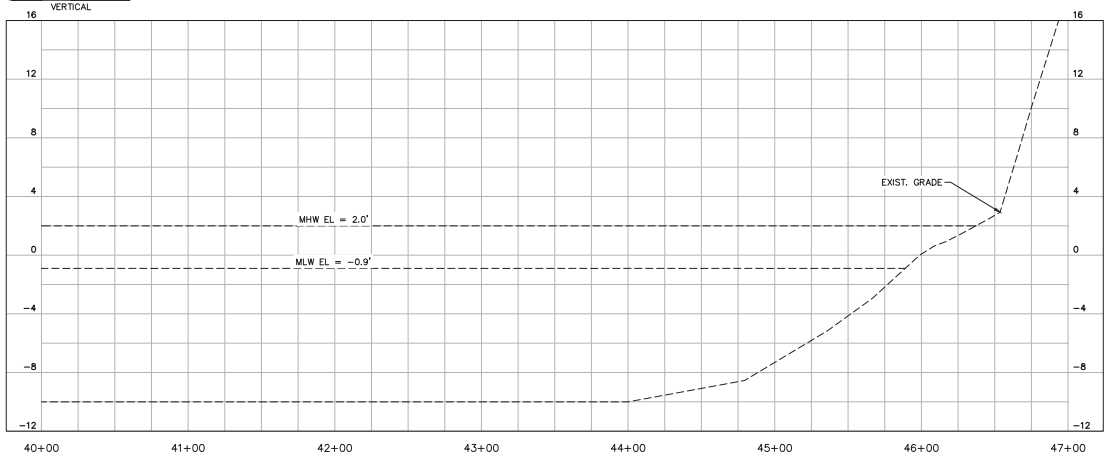
NO.	DATE	BY	REVISION

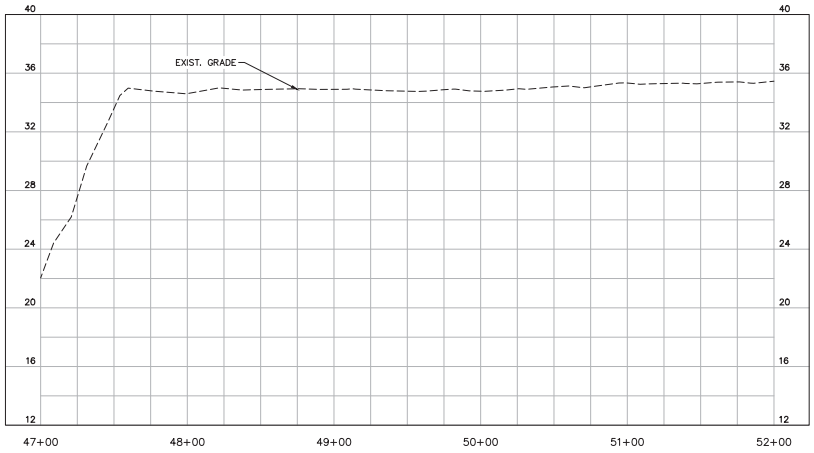
FM Plan and Profile (28+00 - 40+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C3
SCALE:	1" = 40'	SHEET NO.:	5 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

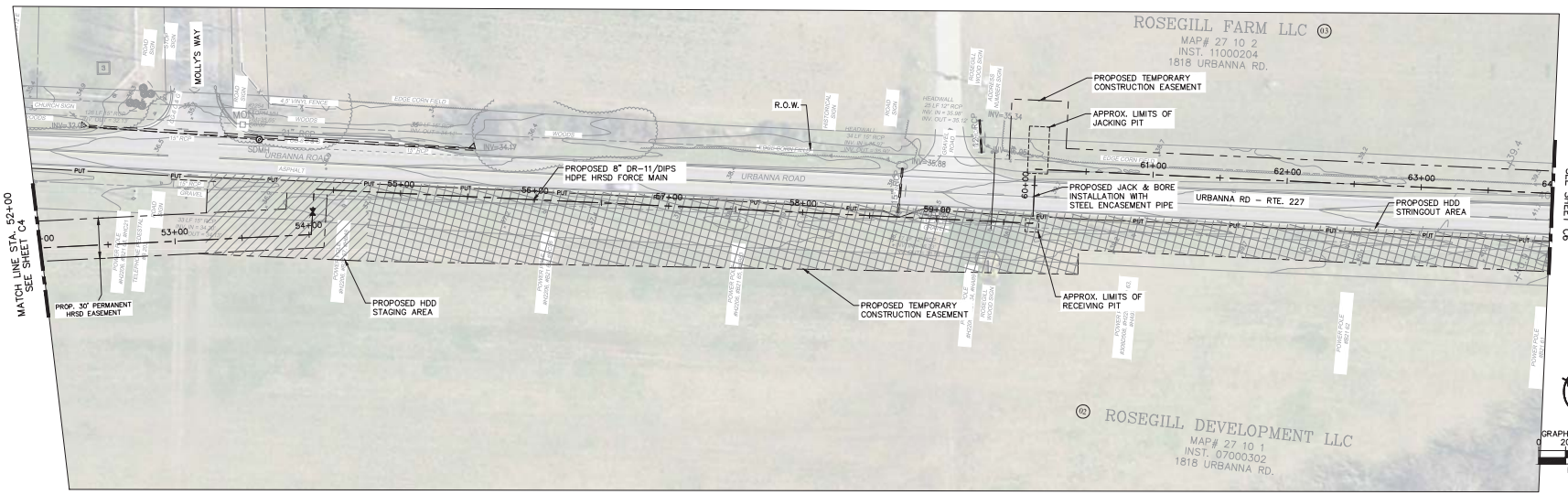
NO.	DATE	BY	REVISION

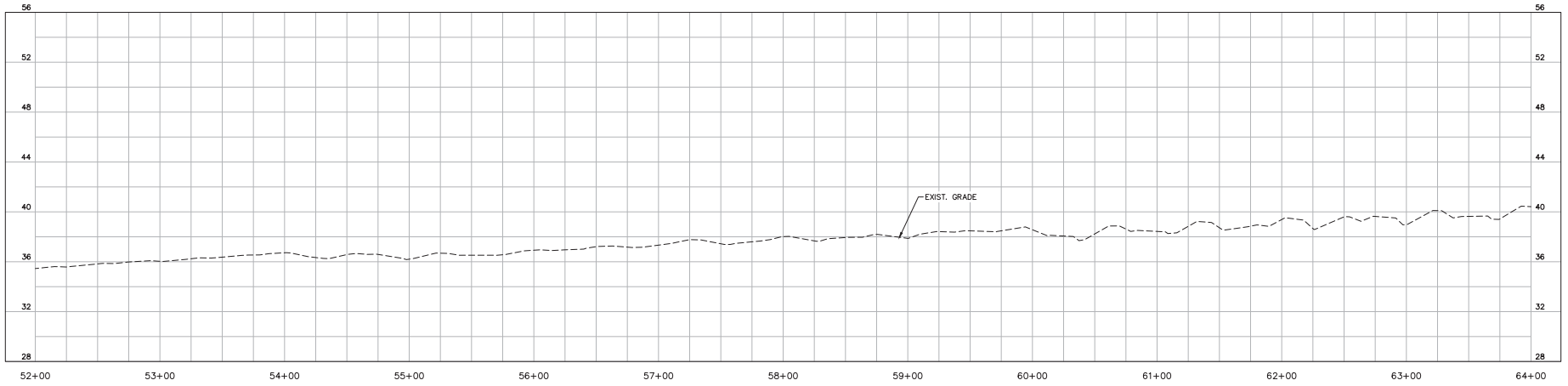
FM Plan and Profile (40+00 - 52+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C4
SCALE:	1" = 40'	SHEET NO.:	6 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

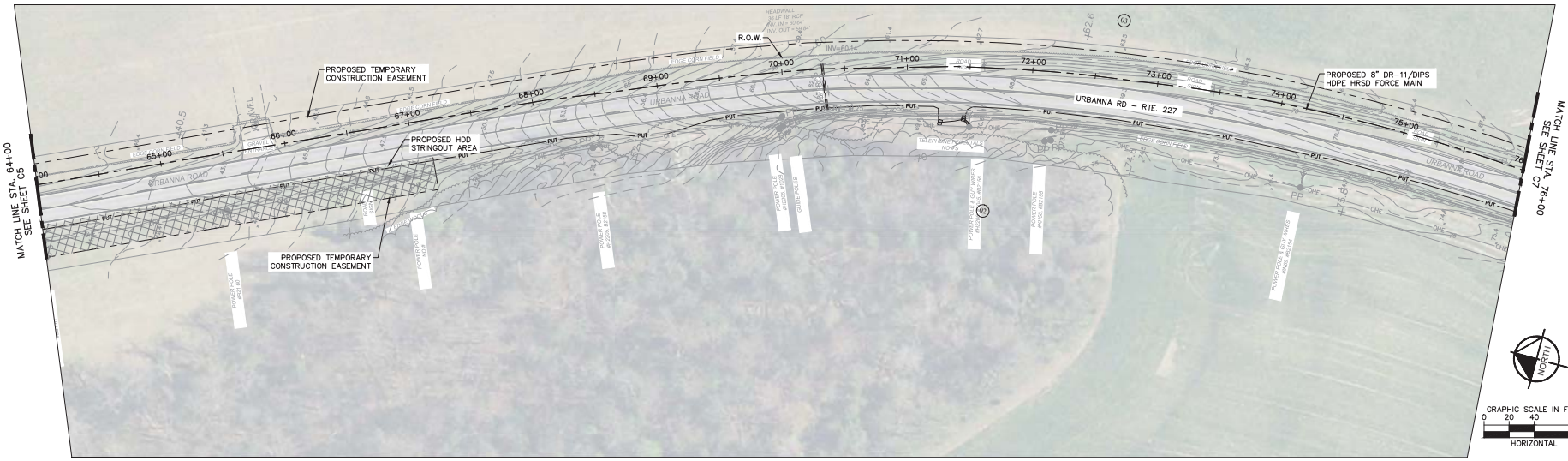
NO.	DATE	BY	REVISION

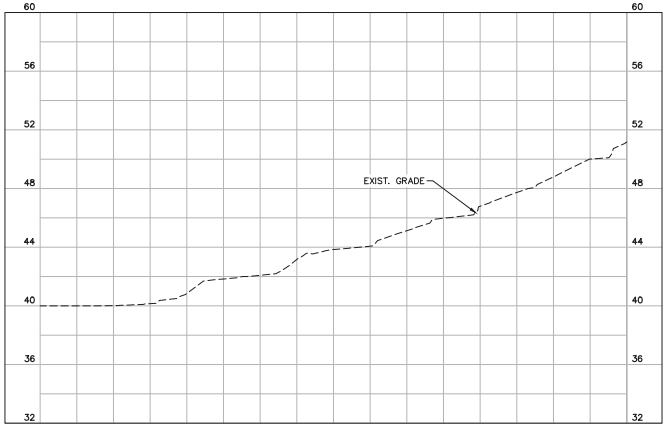
FM Plan and Profile (52+00 - 64+00)

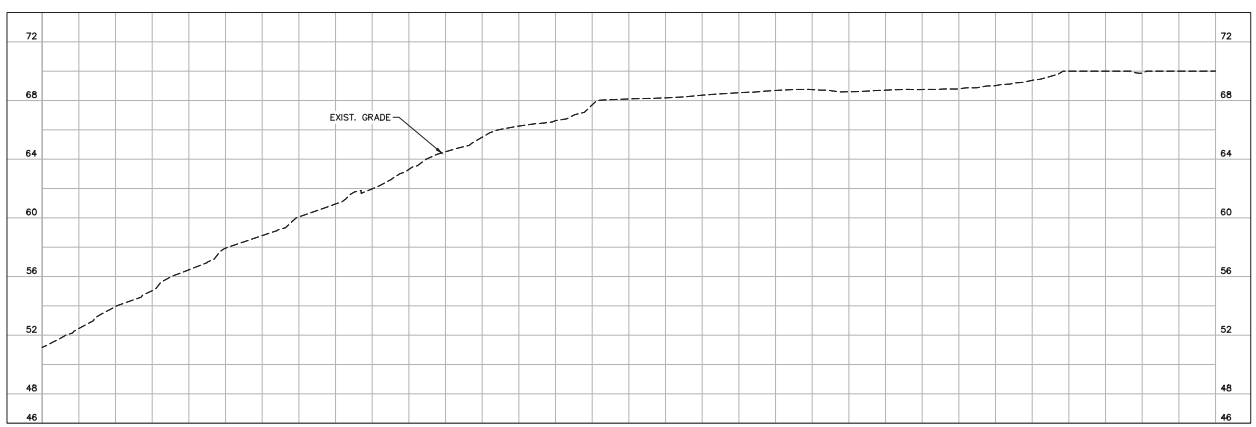
HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C5
SCALE:	1" = 40'	SHEET NO.:	7 of 77







30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

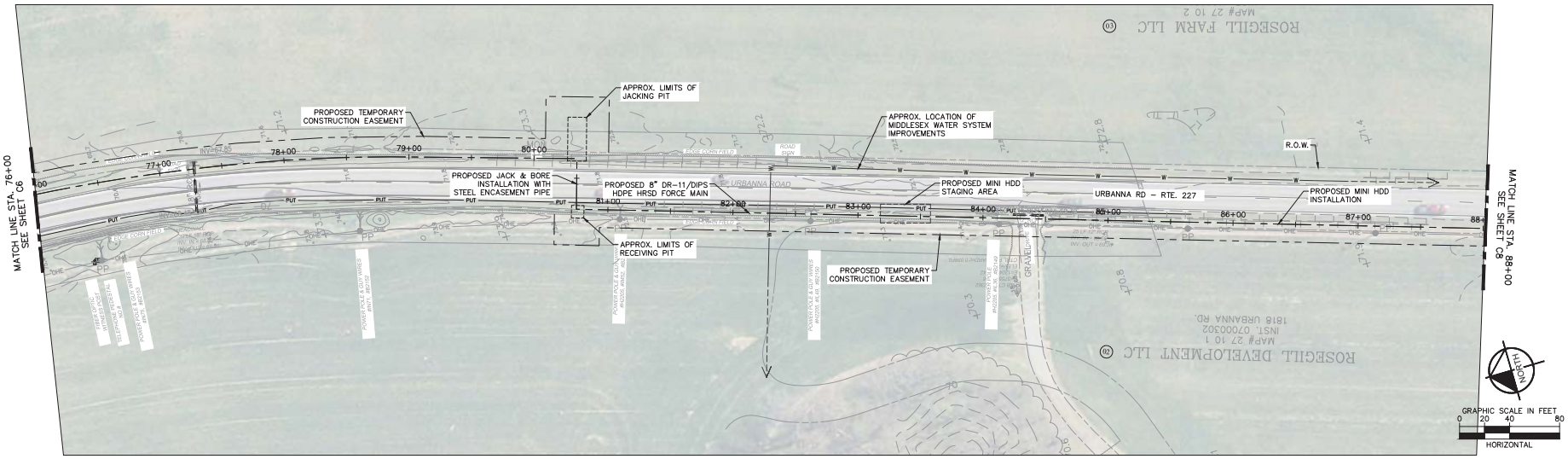
NO.	DATE	BY	REVISION

FM Plan and Profile (64+00 - 76+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C6
SCALE:	1" = 40'	SHEET NO.:	8 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

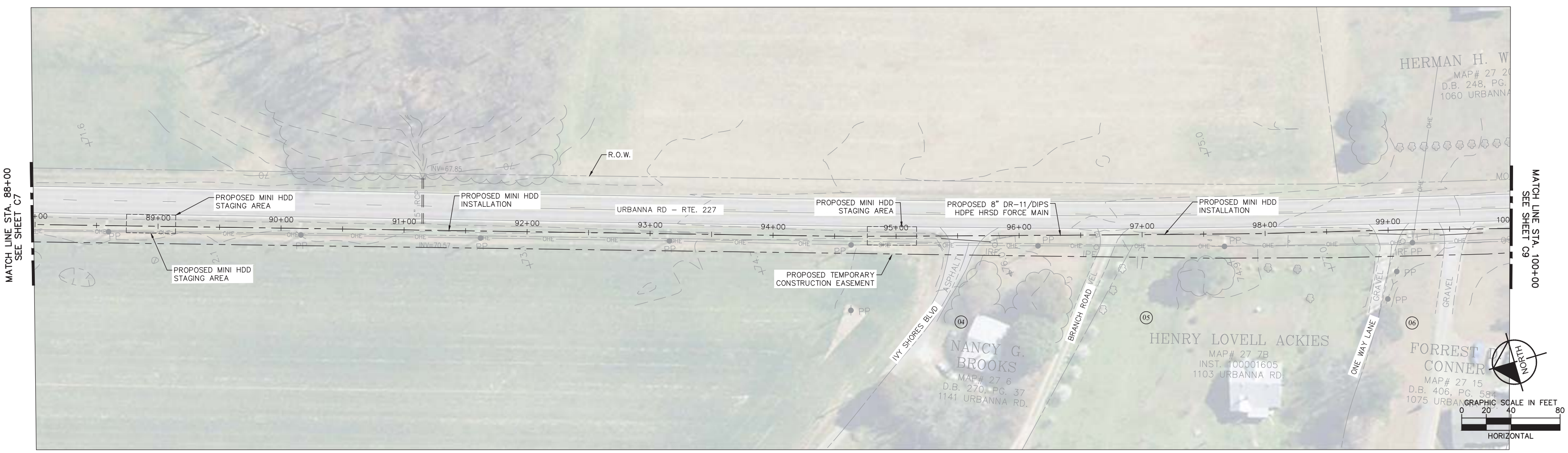
NO.	DATE	BY	REVISION

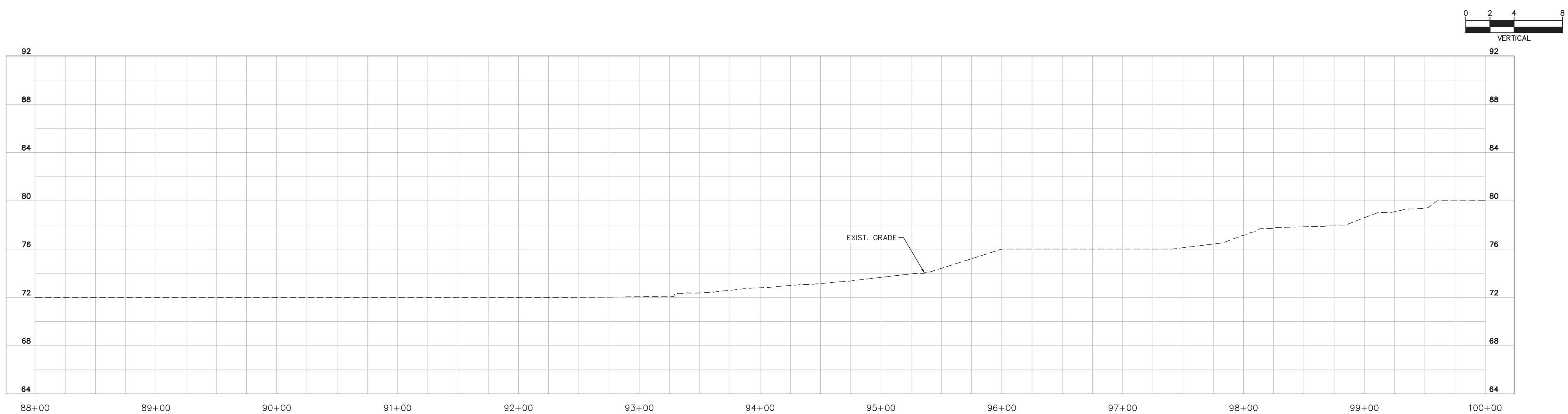
FM Plan and Profile (76+00 - 88+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C7
SCALE:	1" = 40'	SHEET NO.:	9 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

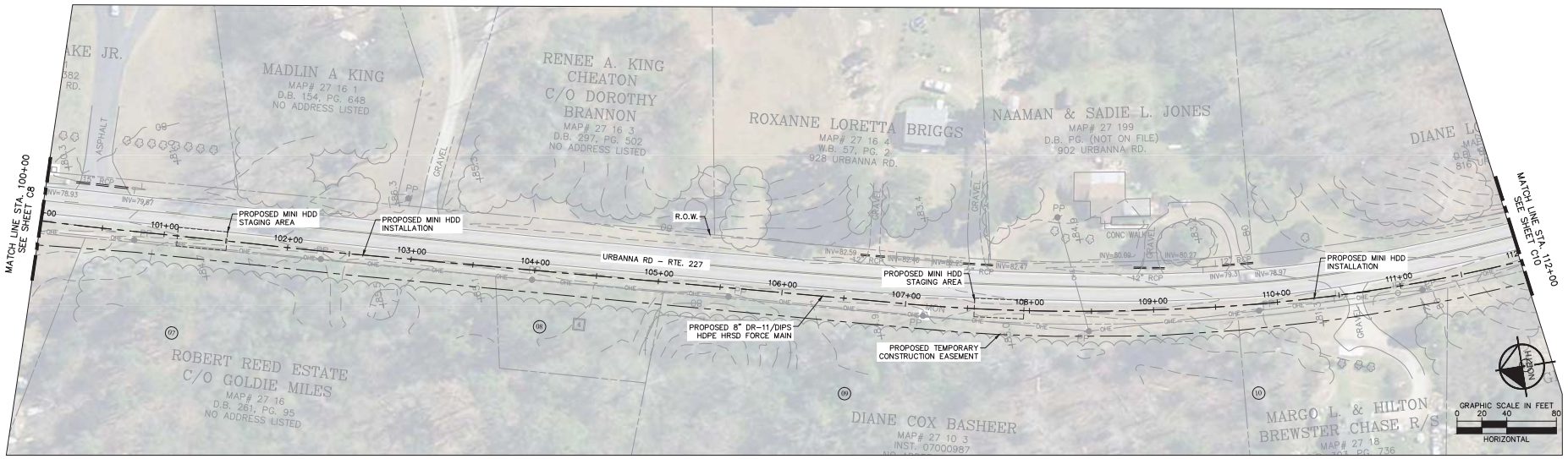
NO.	DATE	BY	REVISION

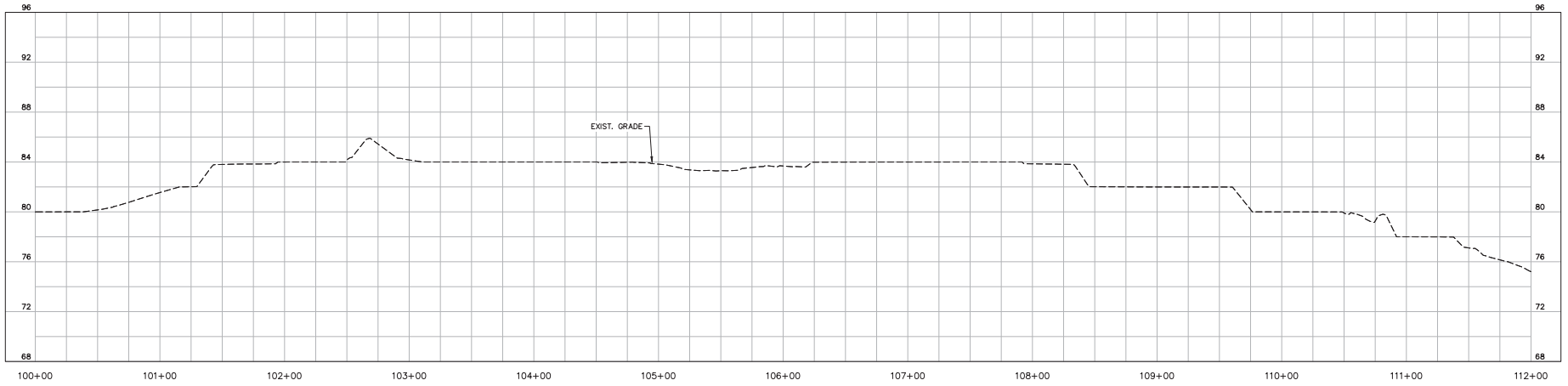
FM Plan and Profile (88+00 - 100+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C8
SCALE:	1" = 40'	SHEET NO.:	10 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

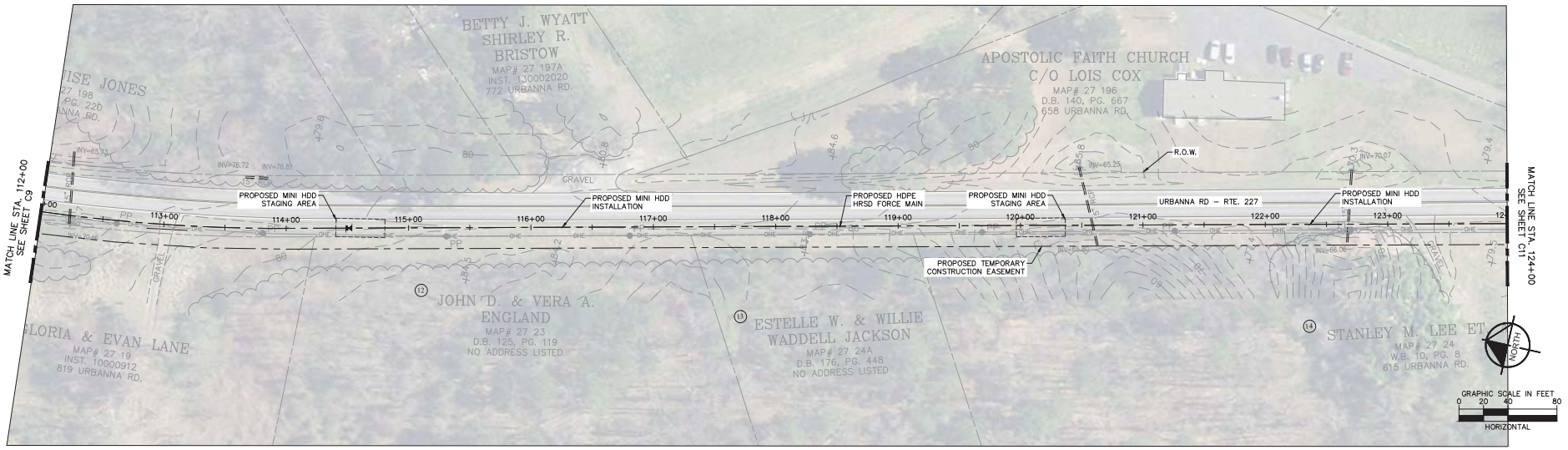
NO.	DATE	BY	REVISION

FM Plan and Profile (100+00 - 112+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C9
SCALE:	1" = 40'	SHEET NO.:	11 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

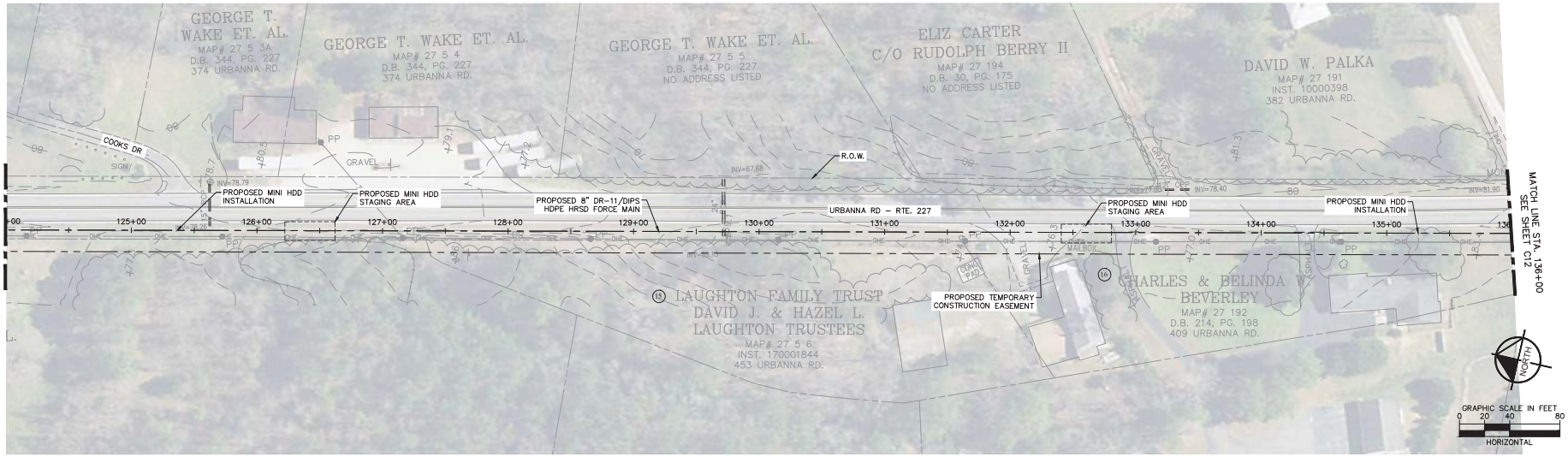
NO.	DATE	BY	REVISION

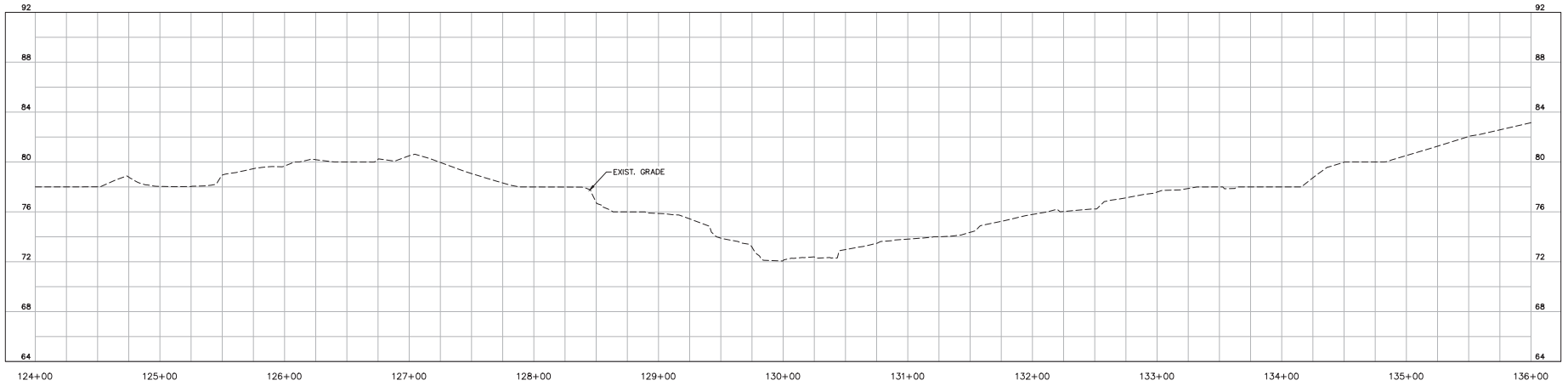
FM Plan and Profile (112+00 - 124+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C10
SCALE:	1" = 40'	SHEET NO.:	12 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

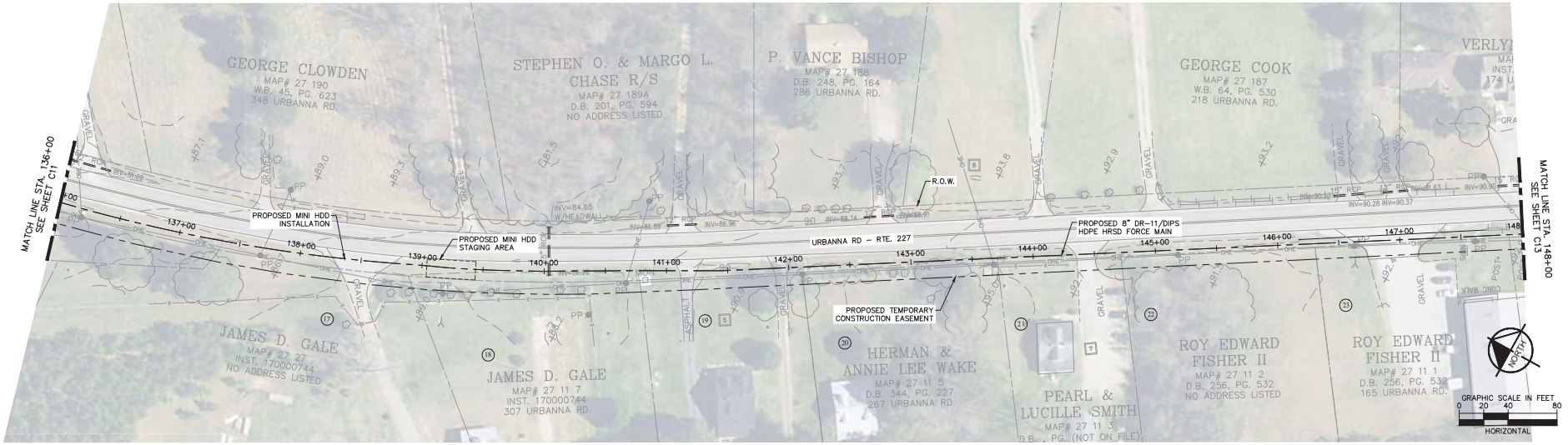
NO.	DATE	BY	REVISION

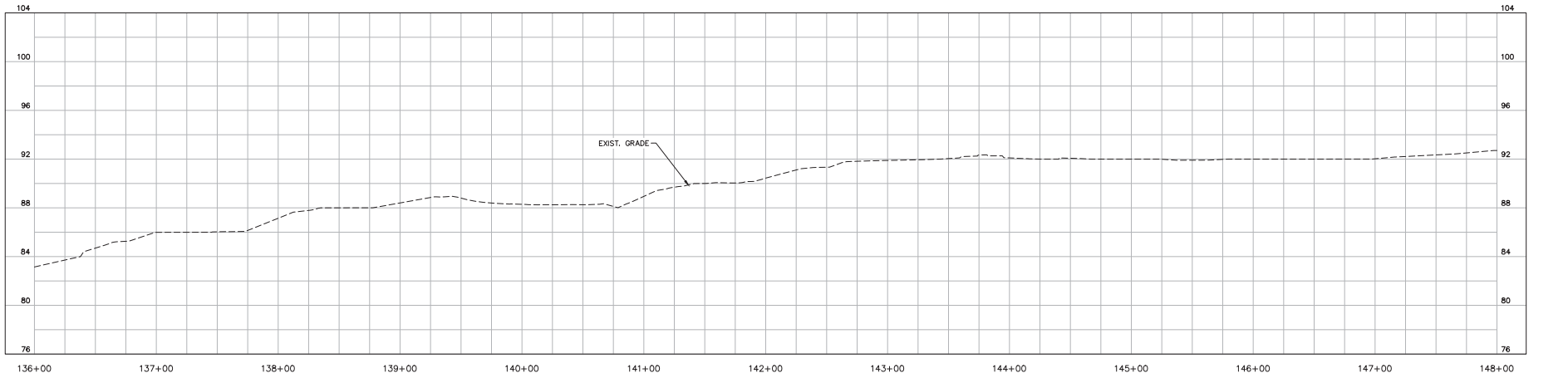
FM Plan and Profile (124+00 - 136+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C11
SCALE:	1" = 40'	SHEET NO.:	13 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

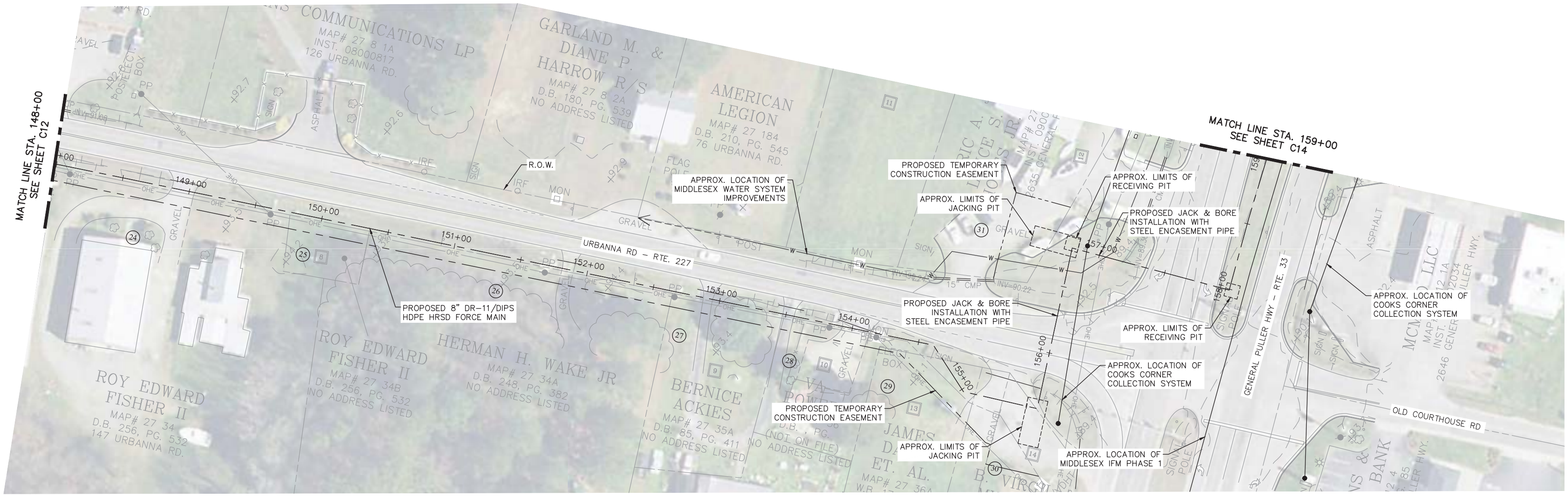
NO.	DATE	BY	REVISION

FM Plan and Profile (136+00 - 148+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

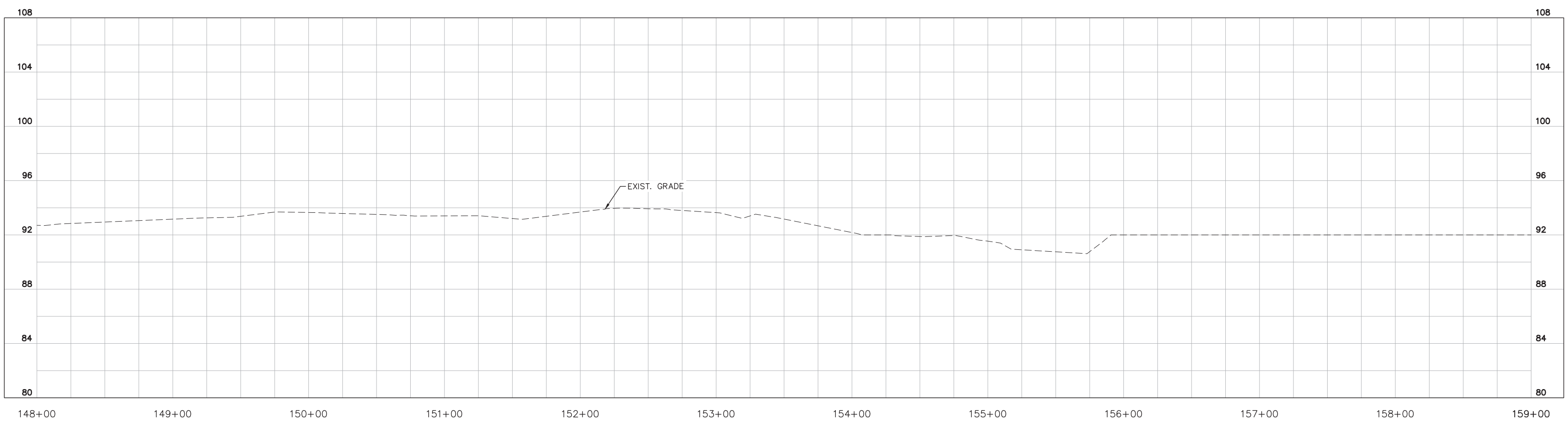
DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C12
SCALE:	1" = 40'	SHEET NO.:	14 of 77



NORTH

GRAPHIC SCALE IN FEET
0 20 40 80
HORIZONTAL

0 2 4 8
VERTICAL



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

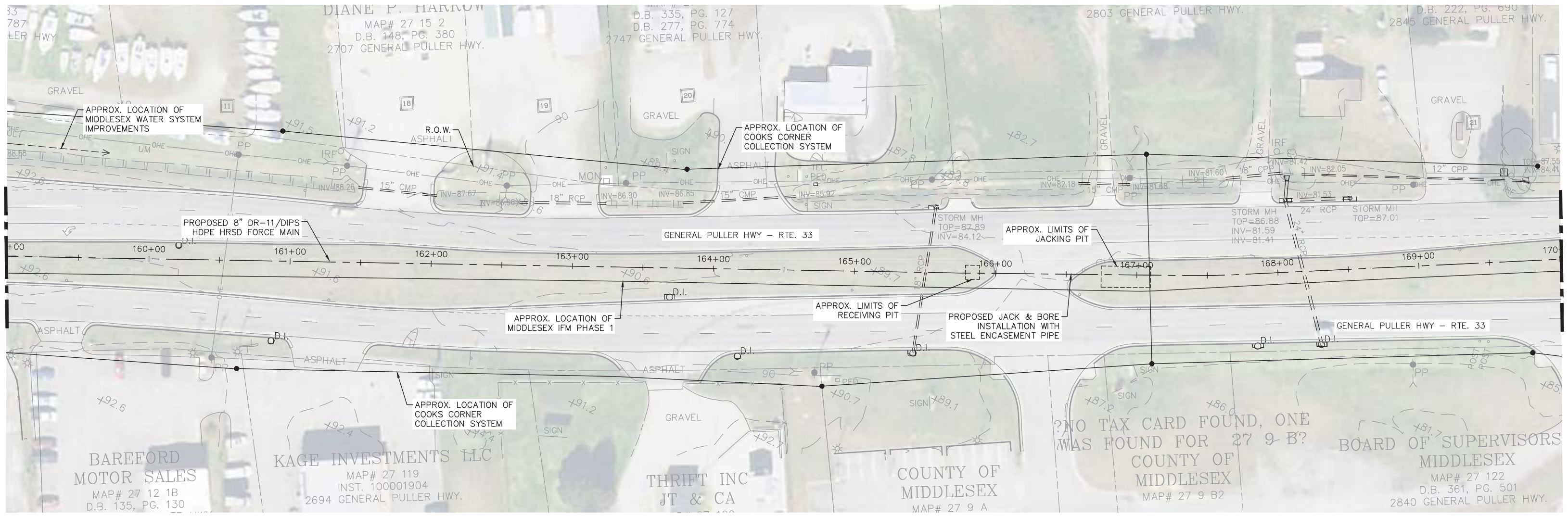
NO.	DATE	BY	REVISION

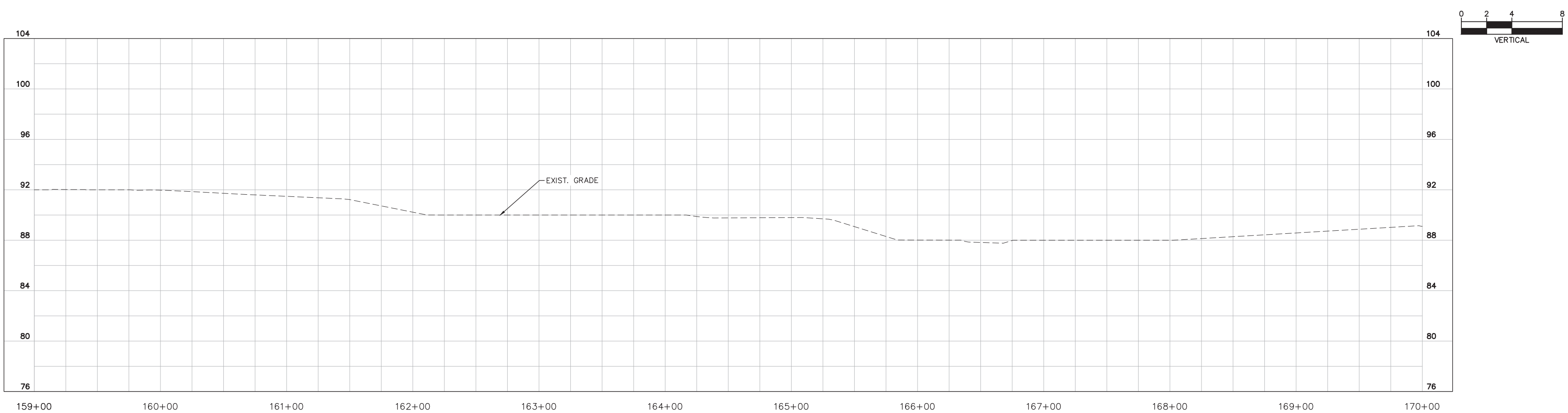
FM Plan and Profile (148+00 - 159+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C13
SCALE:	1" = 40'	SHEET NO.:	15 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

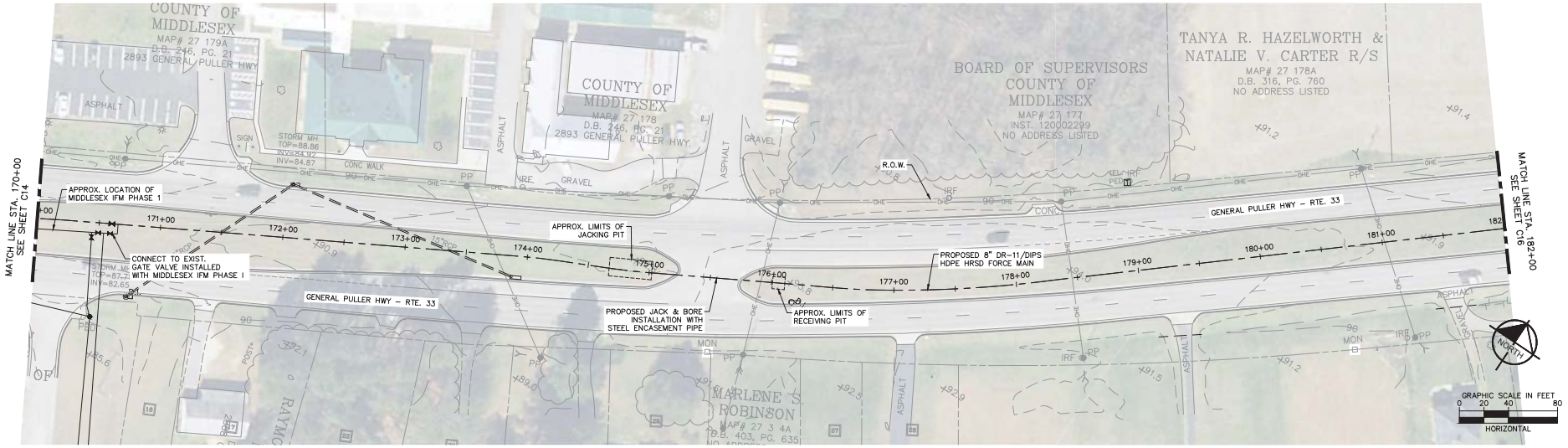
NO.	DATE	BY	REVISION

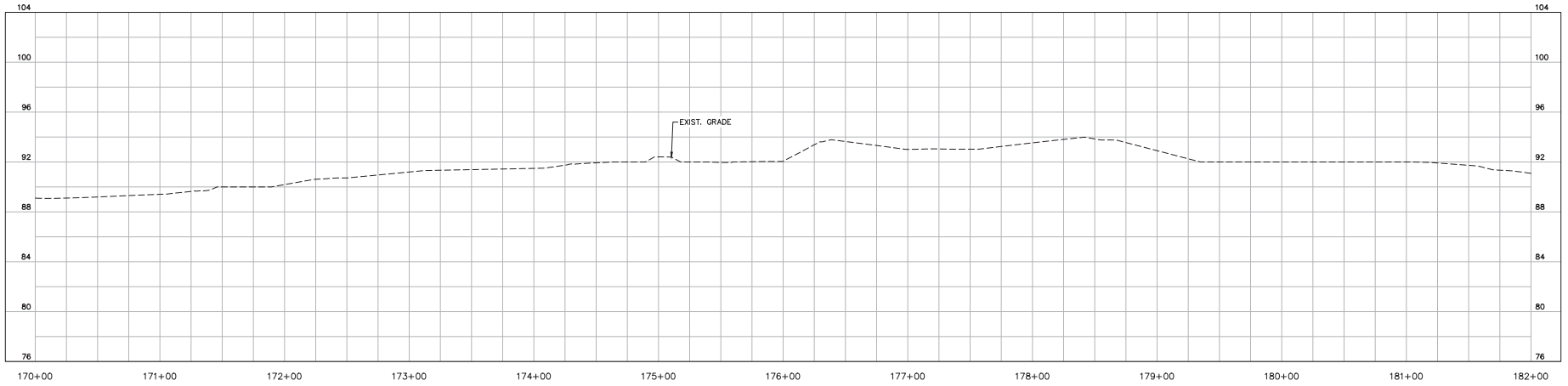
FM Plan and Profile (159+00 - 170+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C14
SCALE:	1" = 40'	SHEET NO.:	16 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

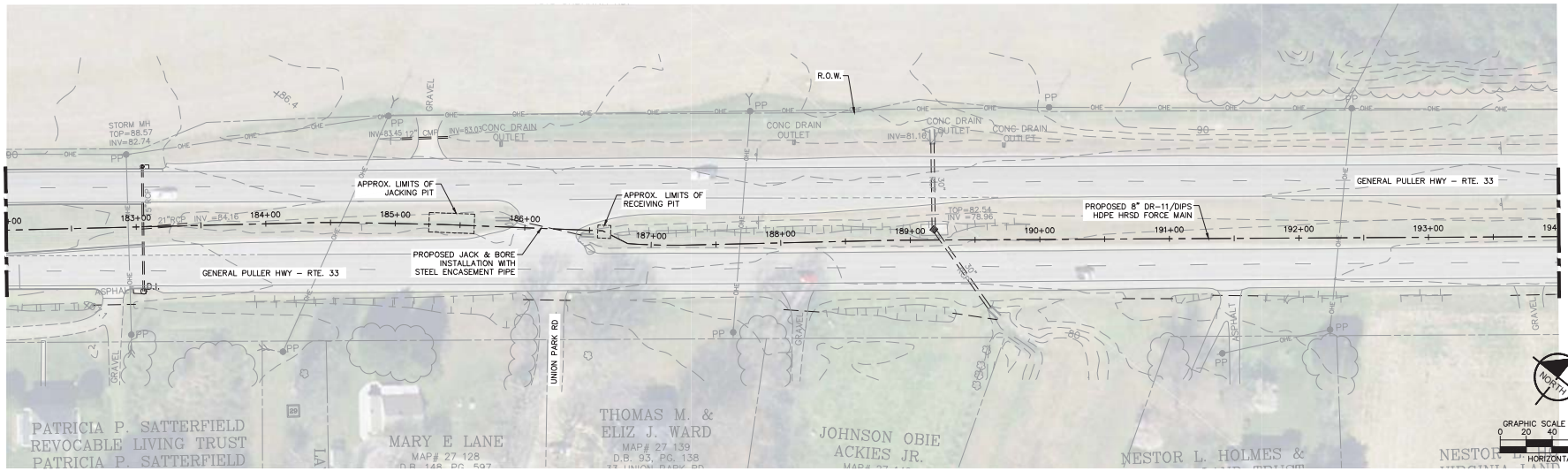
NO.	DATE	BY	REVISION

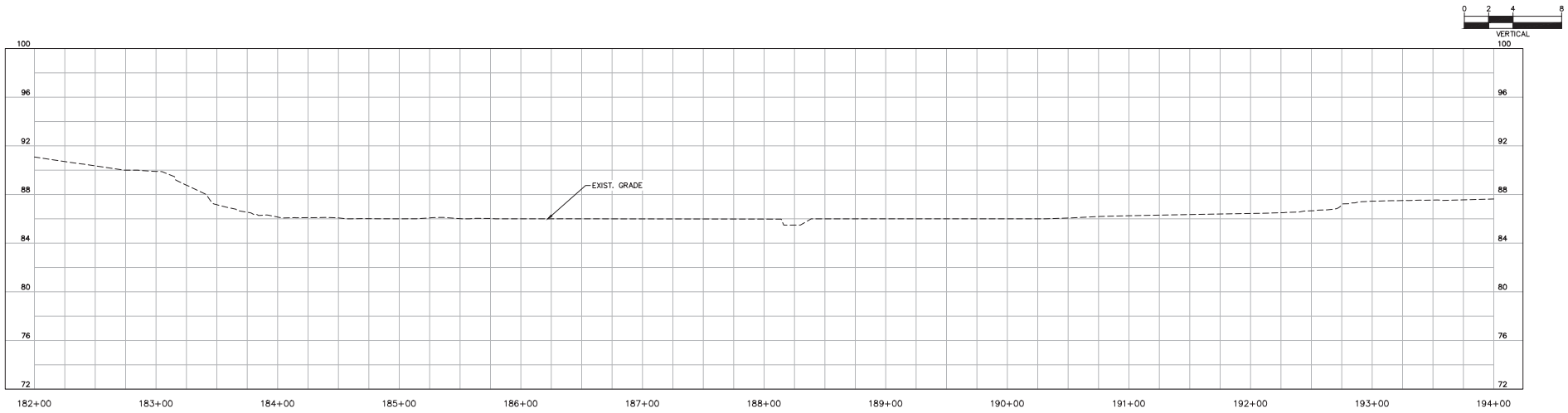
FM Plan and Profile (170+00 - 182+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C15
SCALE:	1" = 40'	SHEET NO.:	17 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

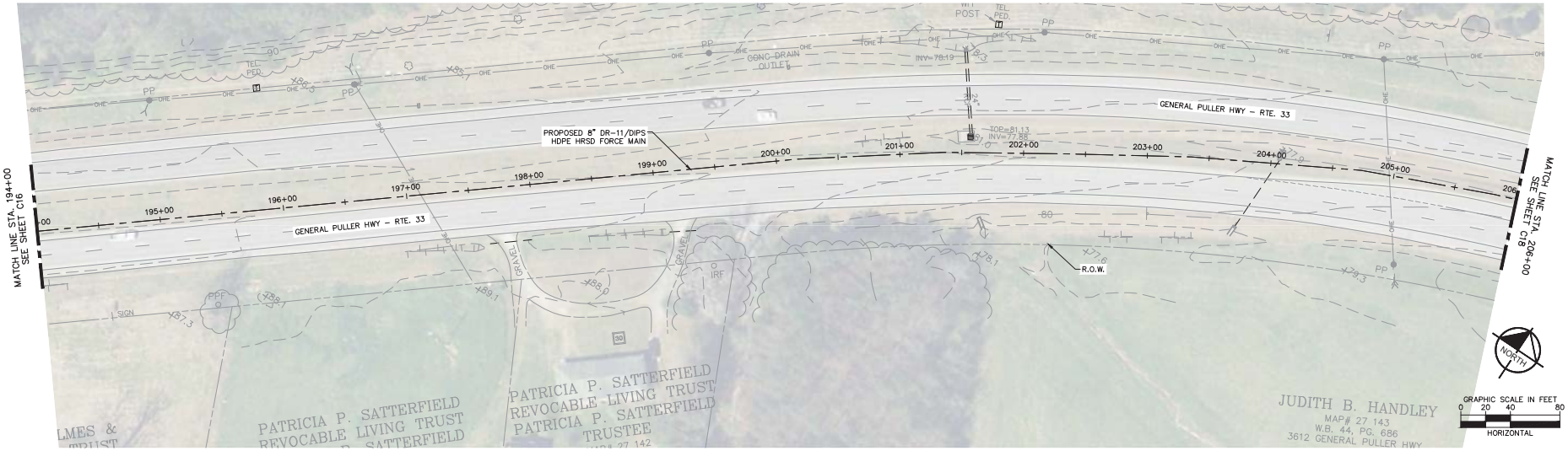
NO.	DATE	BY	REVISION

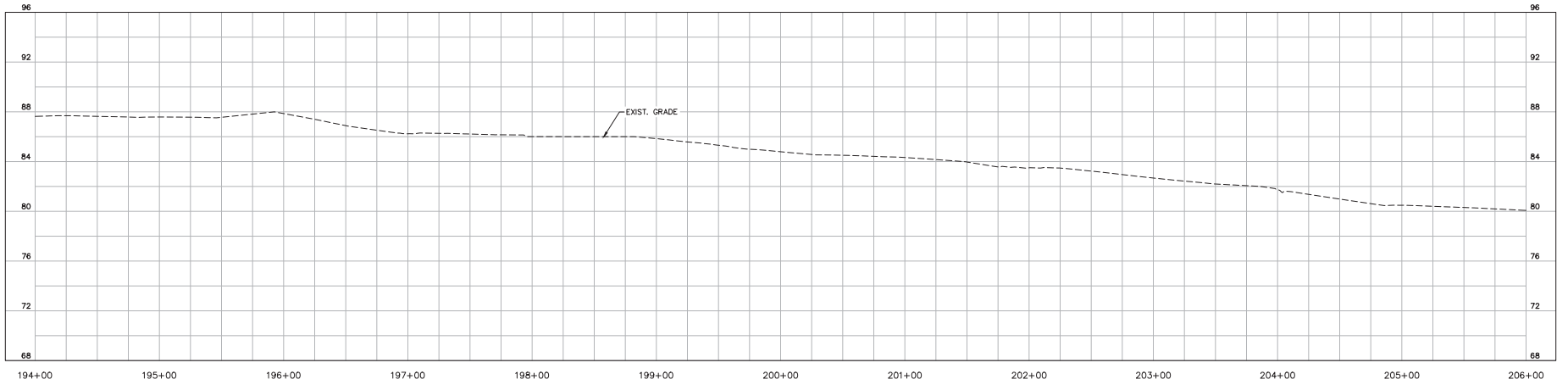
FM Plan and Profile (182+00 - 194+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C16
SCALE:	1" = 40'	SHEET NO.:	18 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

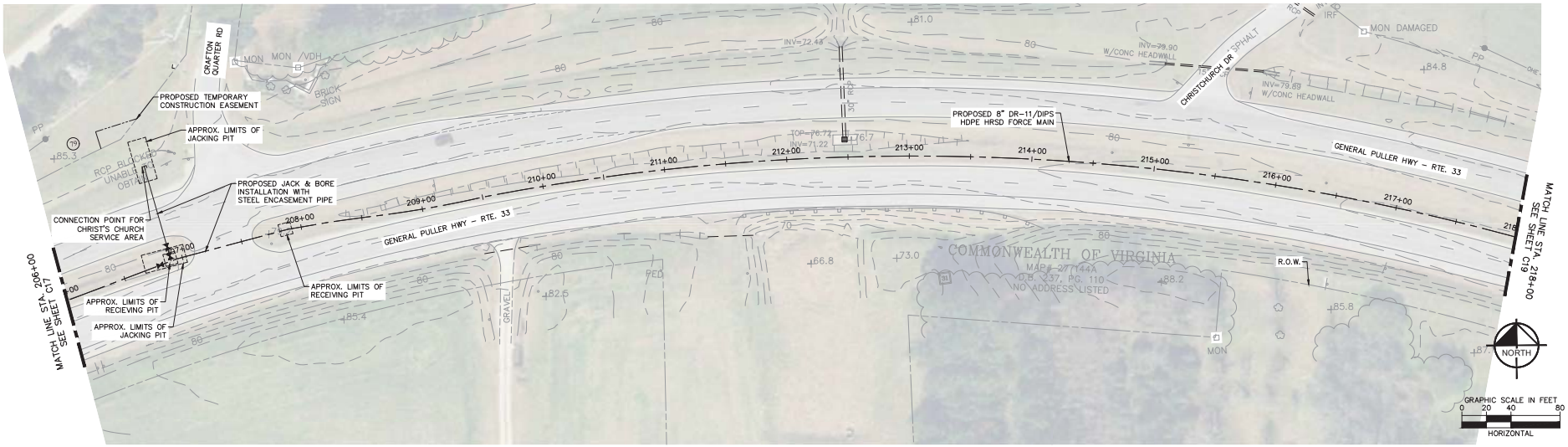
NO.	DATE	BY	REVISION

FM Plan and Profile (194+00 - 206+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C17
SCALE:	1" = 40'	SHEET NO.:	19 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

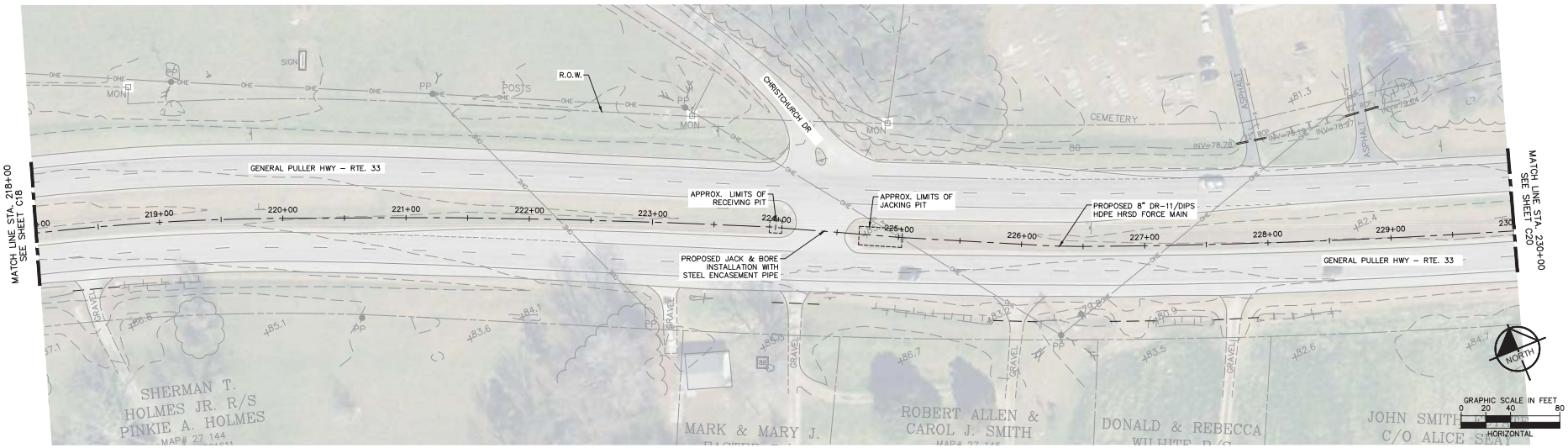
NO.	DATE	BY	REVISION

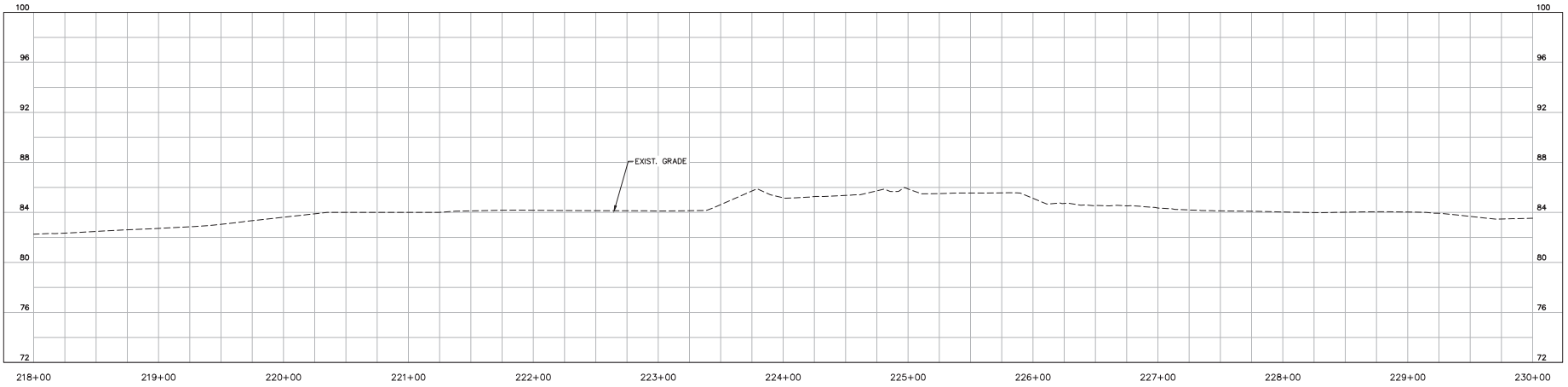
FM Plan and Profile (206+00 - 218+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C18
SCALE:	1" = 40'	SHEET NO.:	20 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

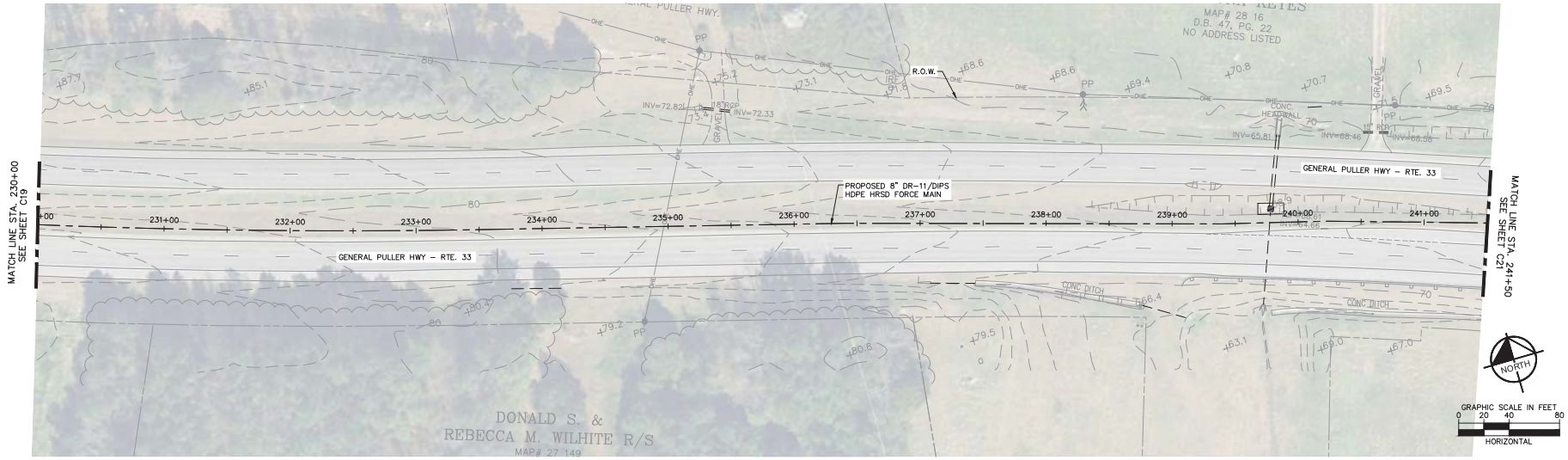
NO.	DATE	BY	REVISION

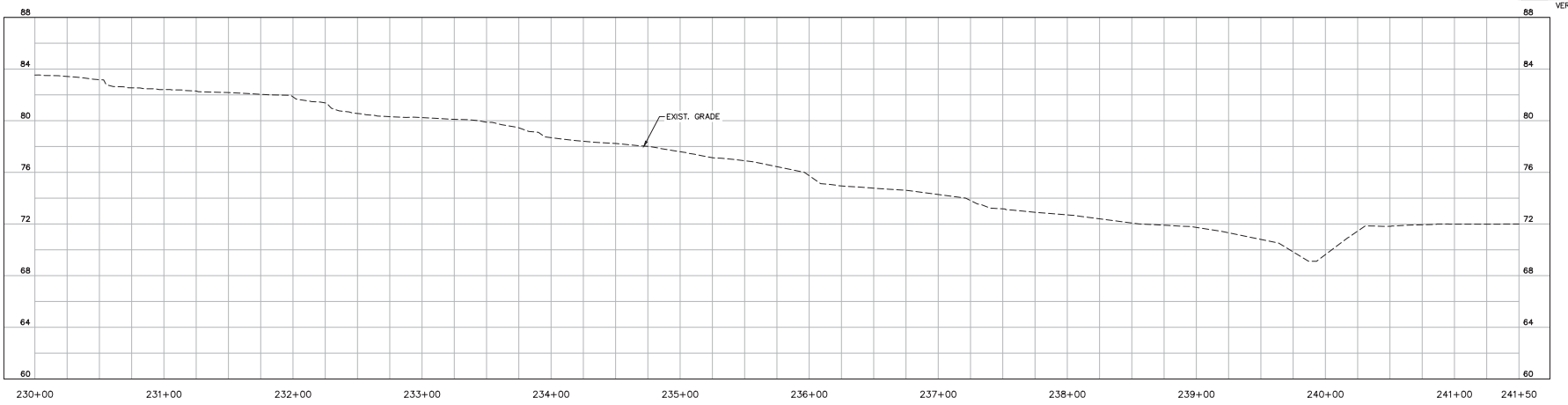
FM Plan and Profile (218+00 - 230+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C19
SCALE:	1" = 40'	SHEET NO.:	21 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

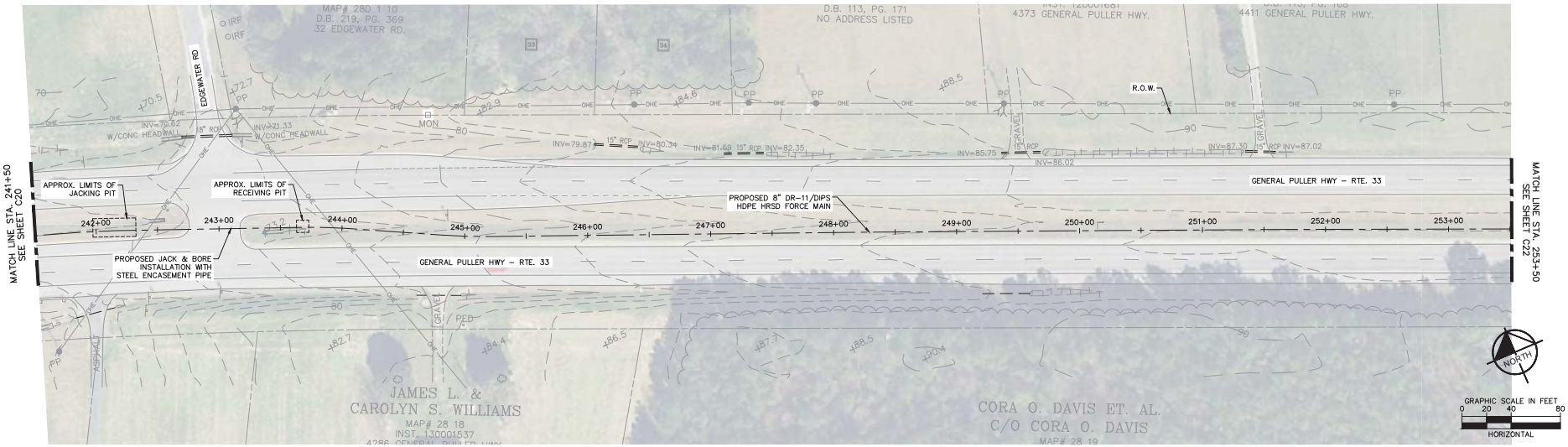
NO.	DATE	BY	REVISION

FM Plan and Profile (230+00 - 241+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C20
SCALE:	1" = 40'	SHEET NO.:	22 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

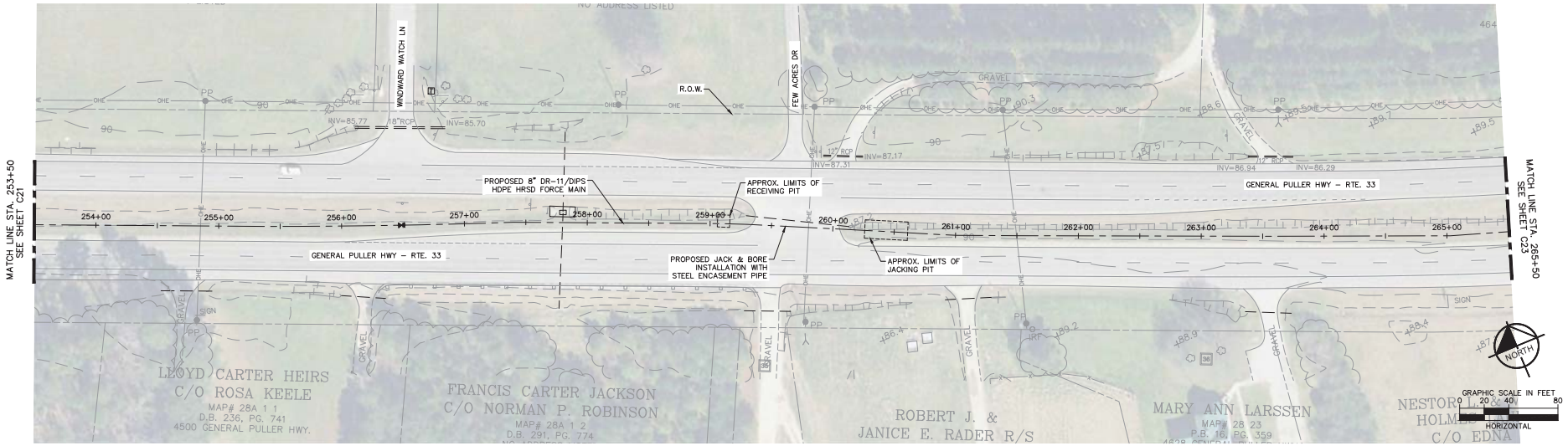
NO.	DATE	BY	REVISION

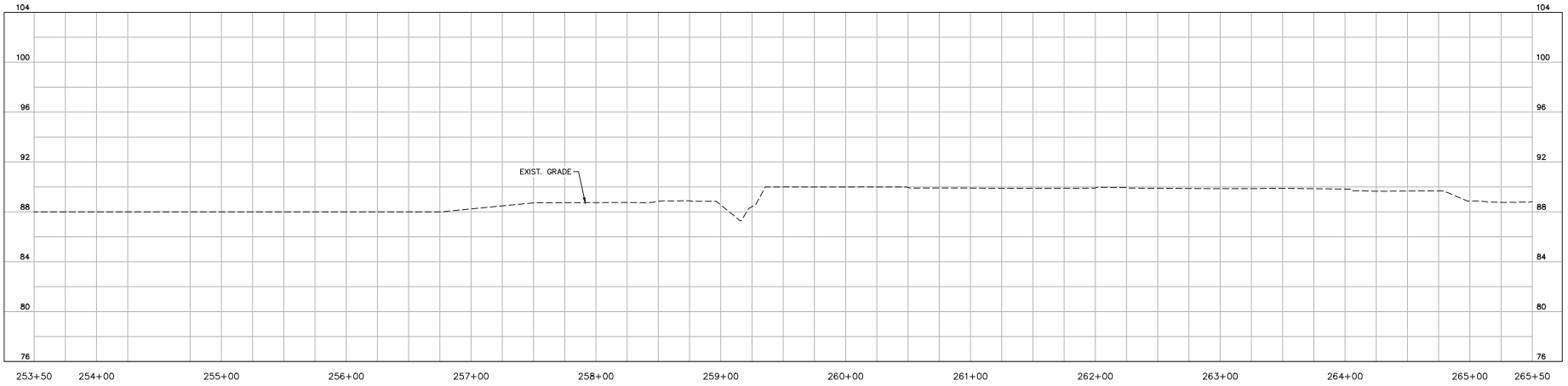
FM Plan and Profile (241+50 - 253+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C21
SCALE:	1" = 40'	SHEET NO.:	23 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

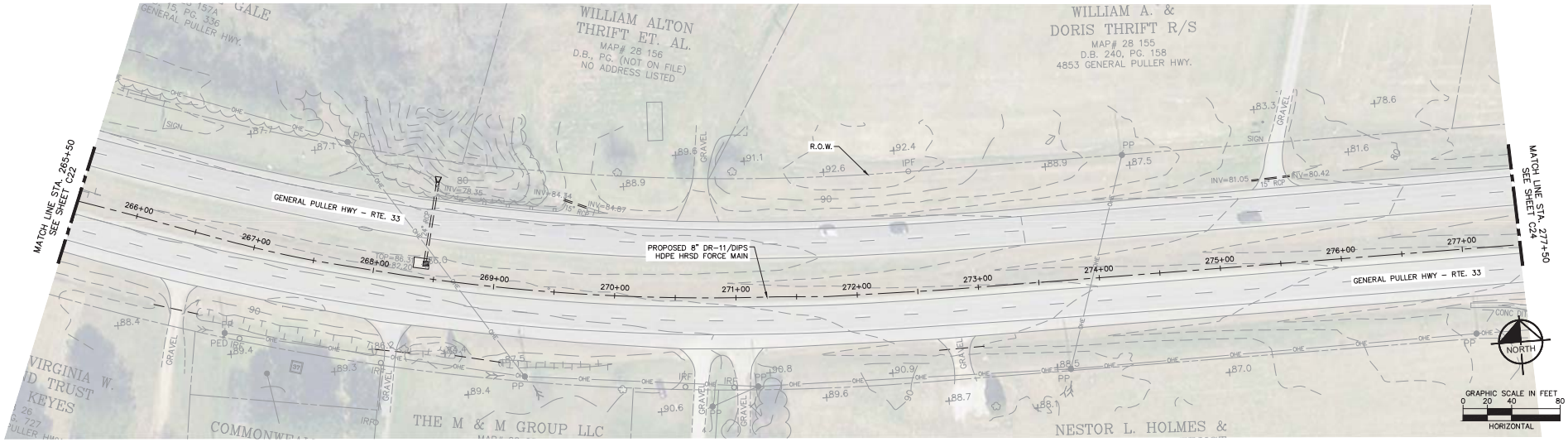
NO.	DATE	BY	REVISION

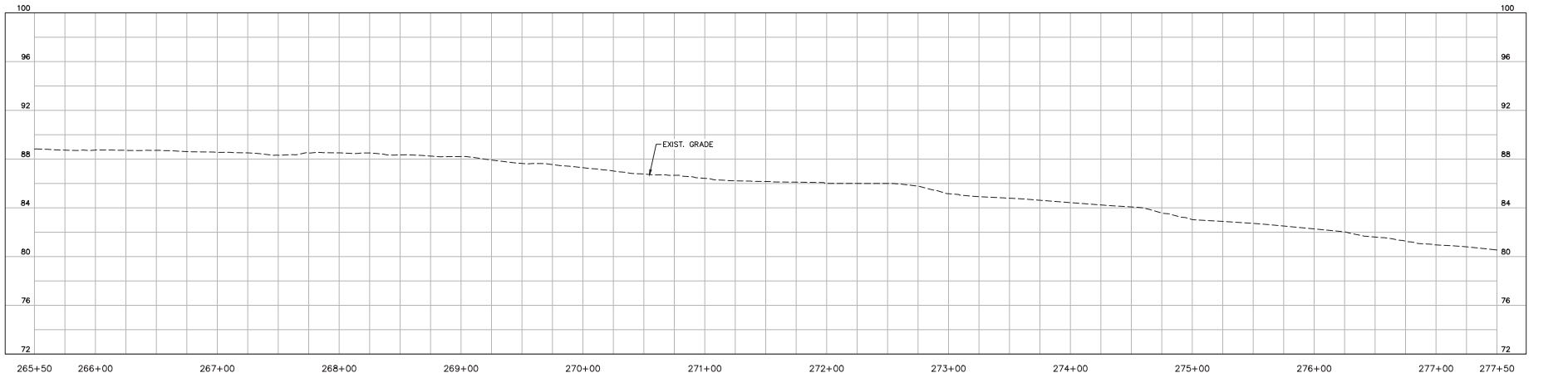
FM Plan and Profile (253+50 - 265+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C22
SCALE:	1" = 40'	SHEET NO.:	24 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

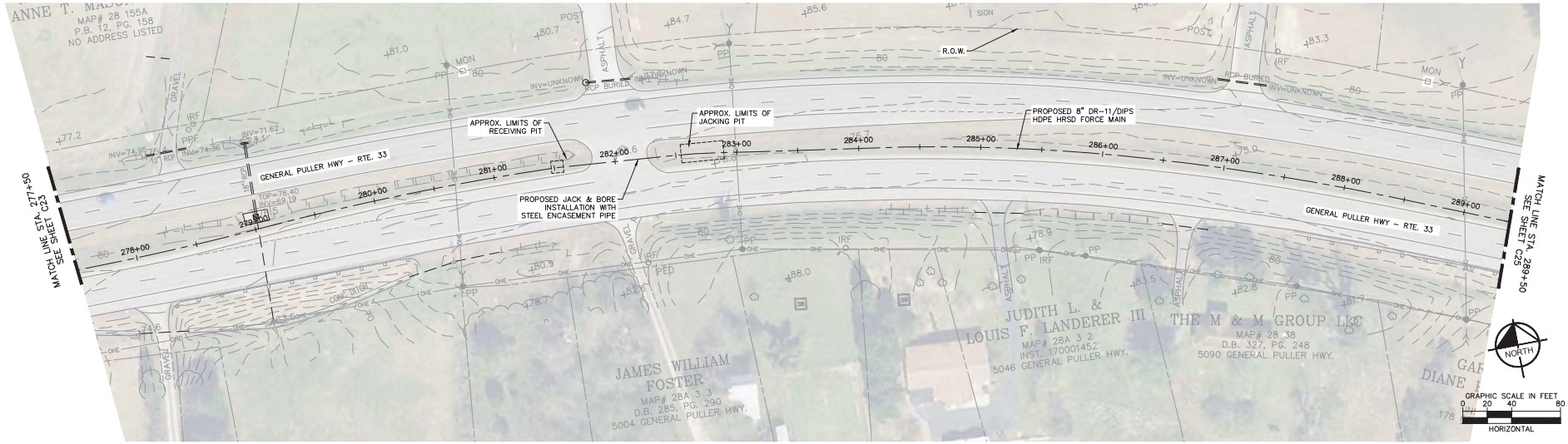
NO.	DATE	BY	REVISION

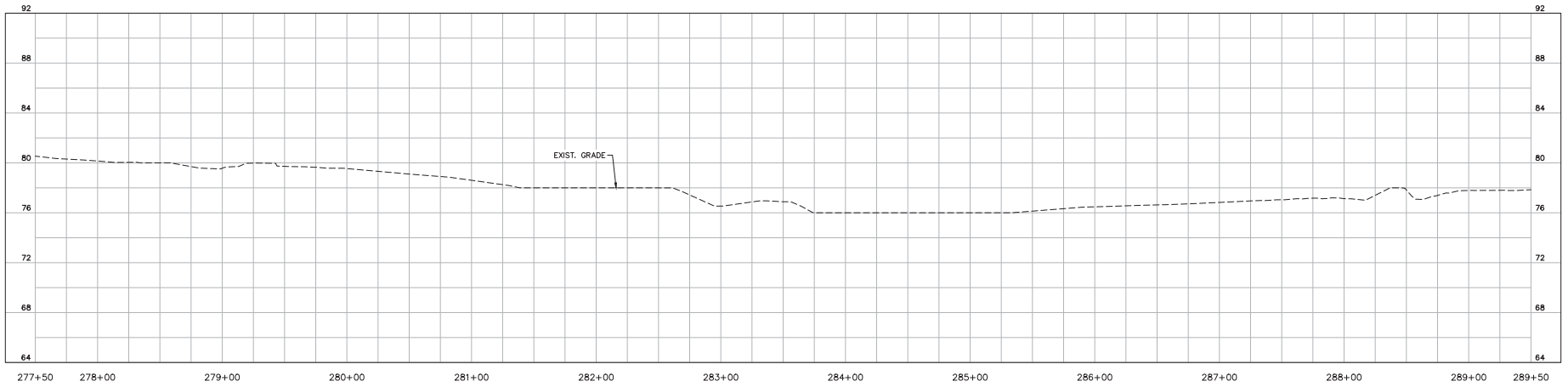
FM Plan and Profile (265+50 - 277+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C23
SCALE:	1" = 40'	SHEET NO.:	25 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

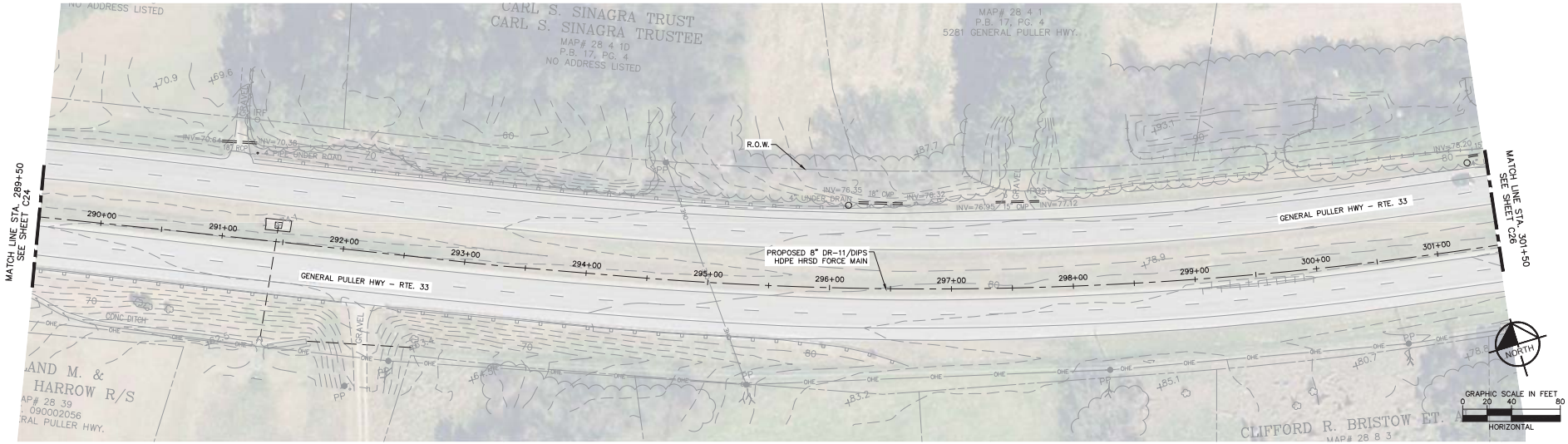
NO.	DATE	BY	REVISION

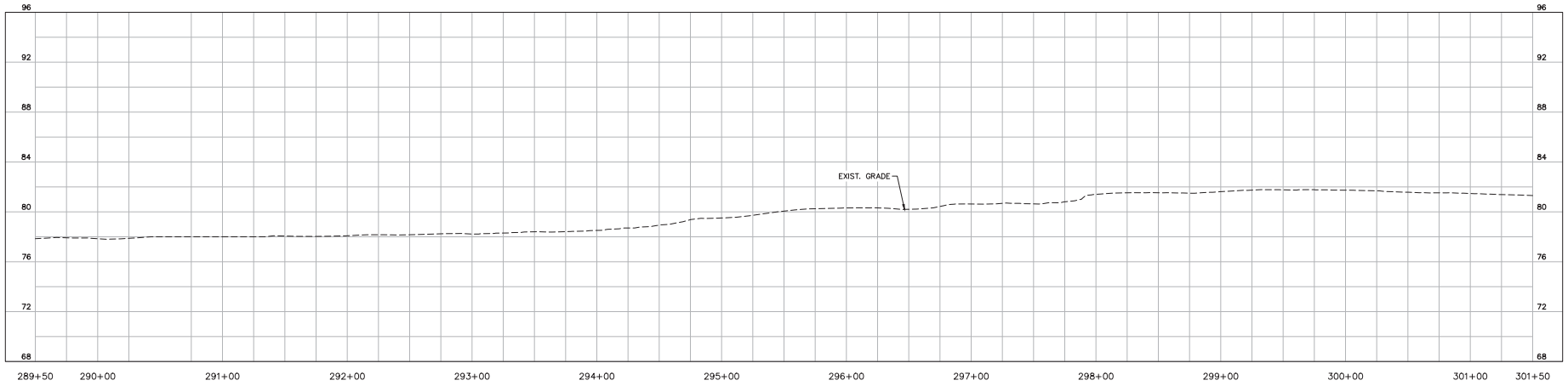
FM Plan and Profile (277+50 - 289+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C24
SCALE:	1" = 40'	SHEET NO.:	26 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

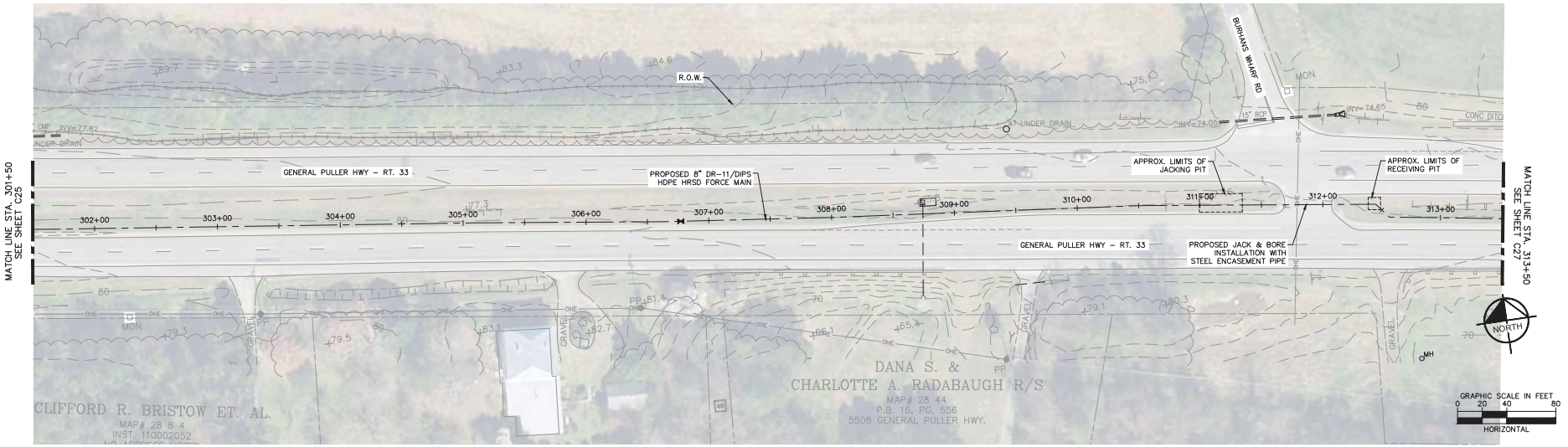
NO.	DATE	BY	REVISION

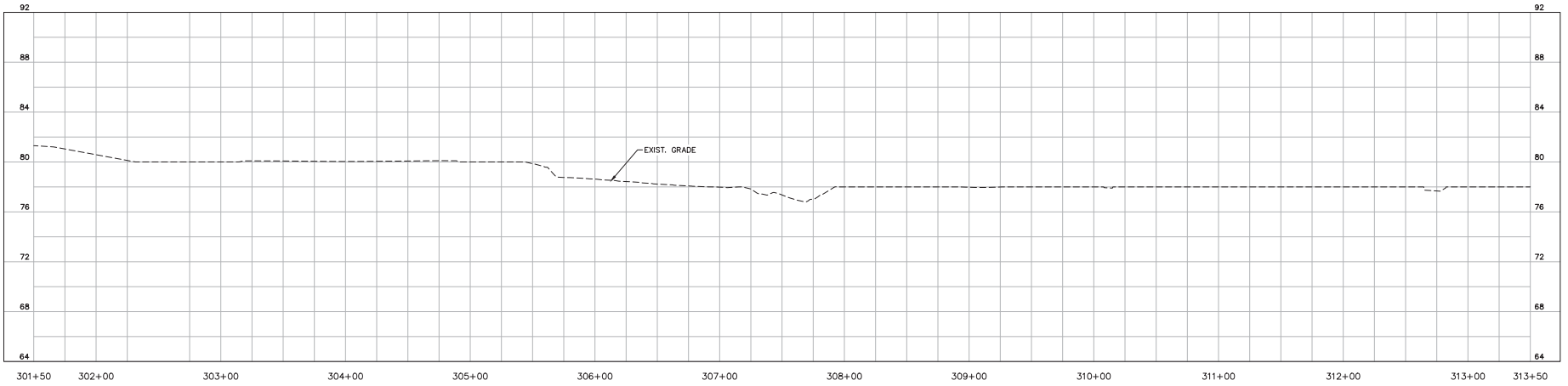
FM Plan and Profile (289+50 - 301+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C25
SCALE:	1" = 40'	SHEET NO.:	27 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

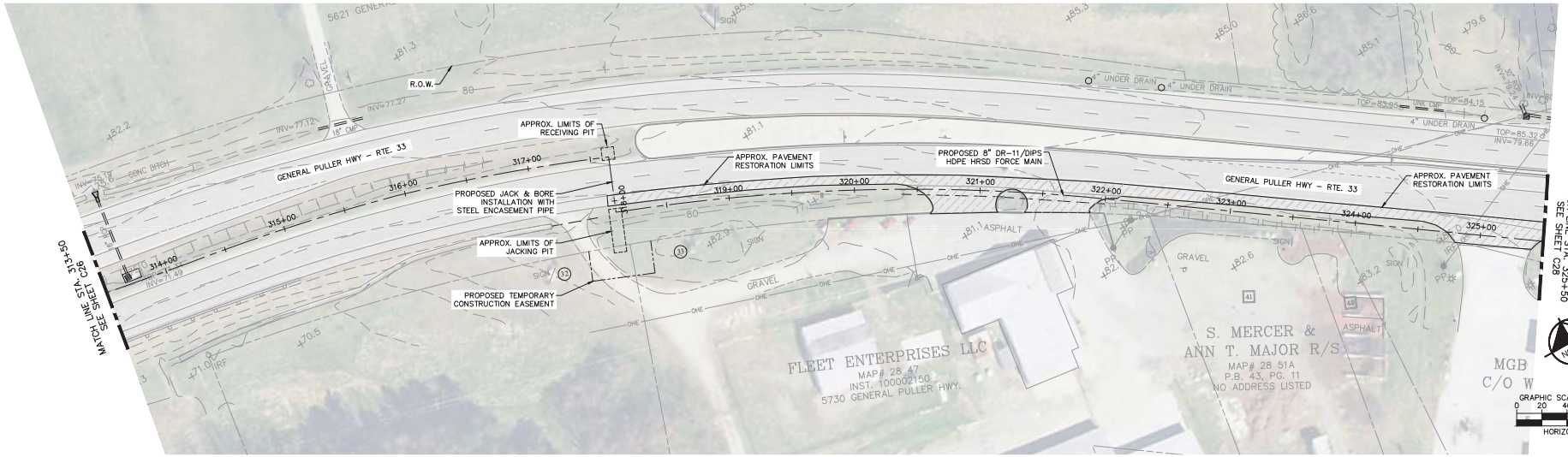
NO.	DATE	BY	REVISION

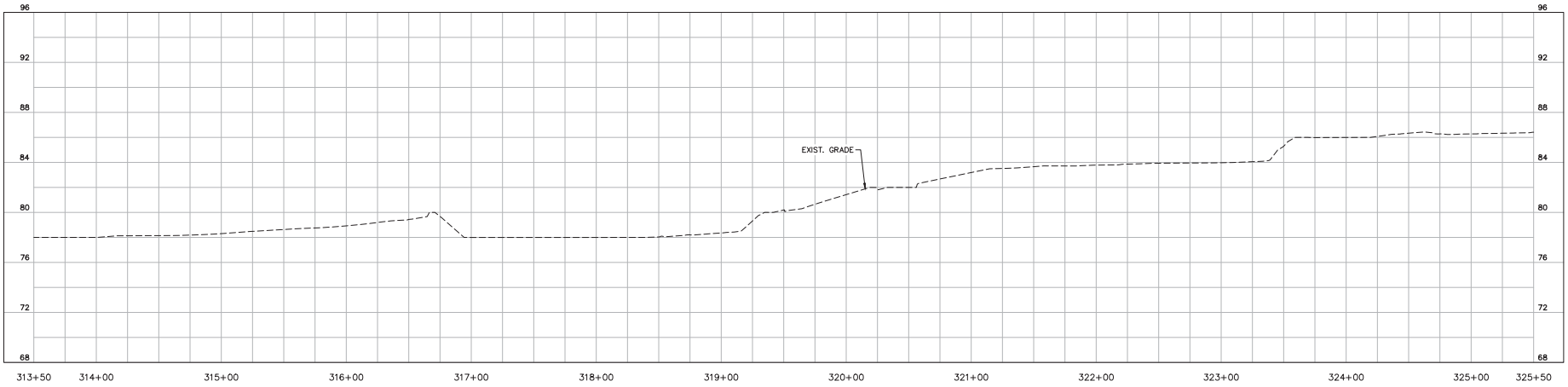
FM Plan and Profile (301+50 - 313+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C26
SCALE:	1" = 40'	SHEET NO.:	28 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

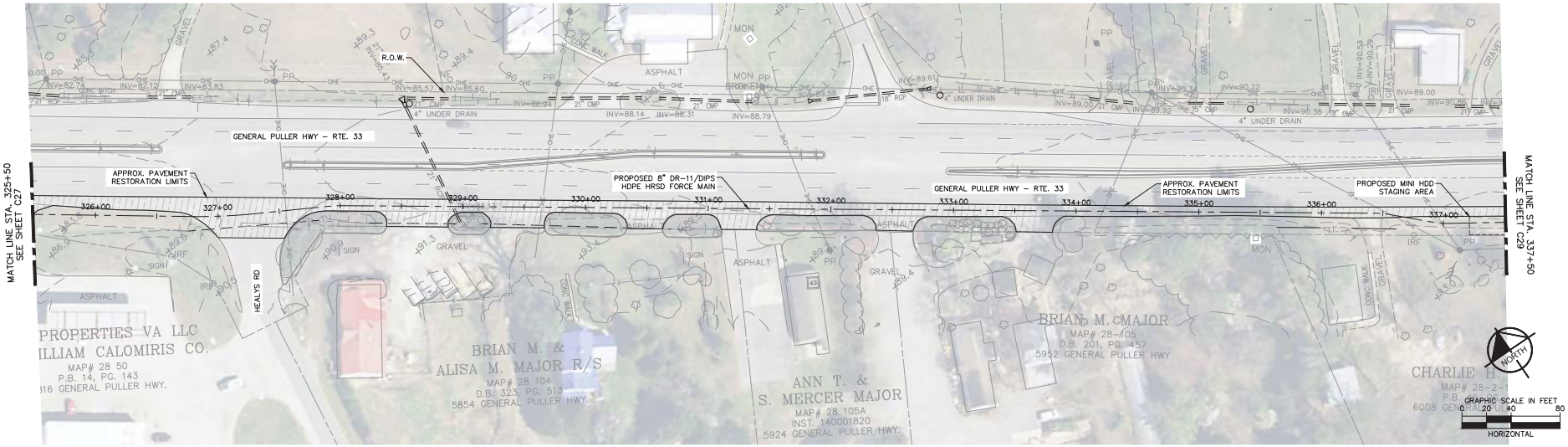
NO.	DATE	BY	REVISION

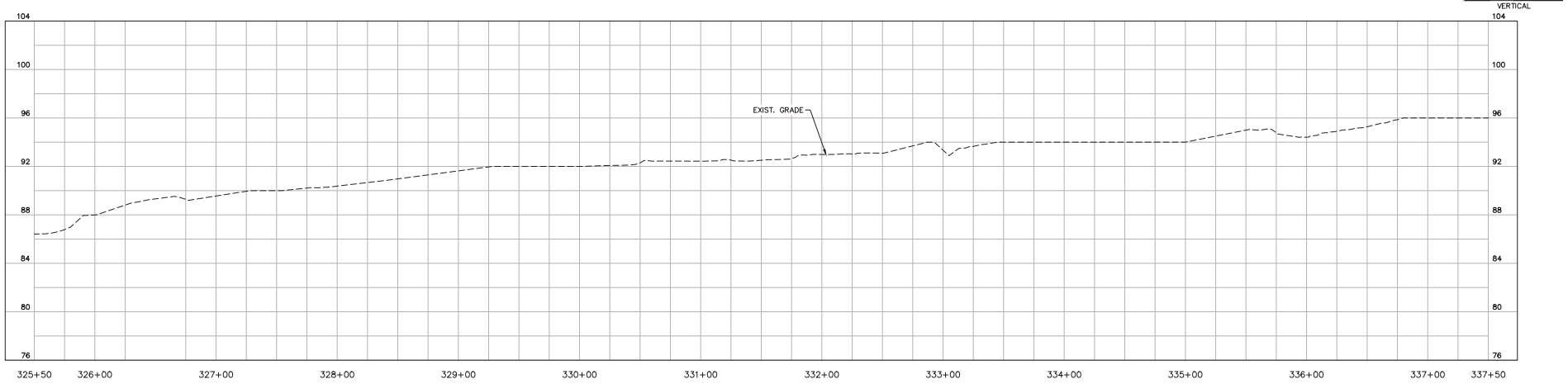
FM Plan and Profile (313+50 - 325+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C27
SCALE:	1" = 40'	SHEET NO.:	29 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

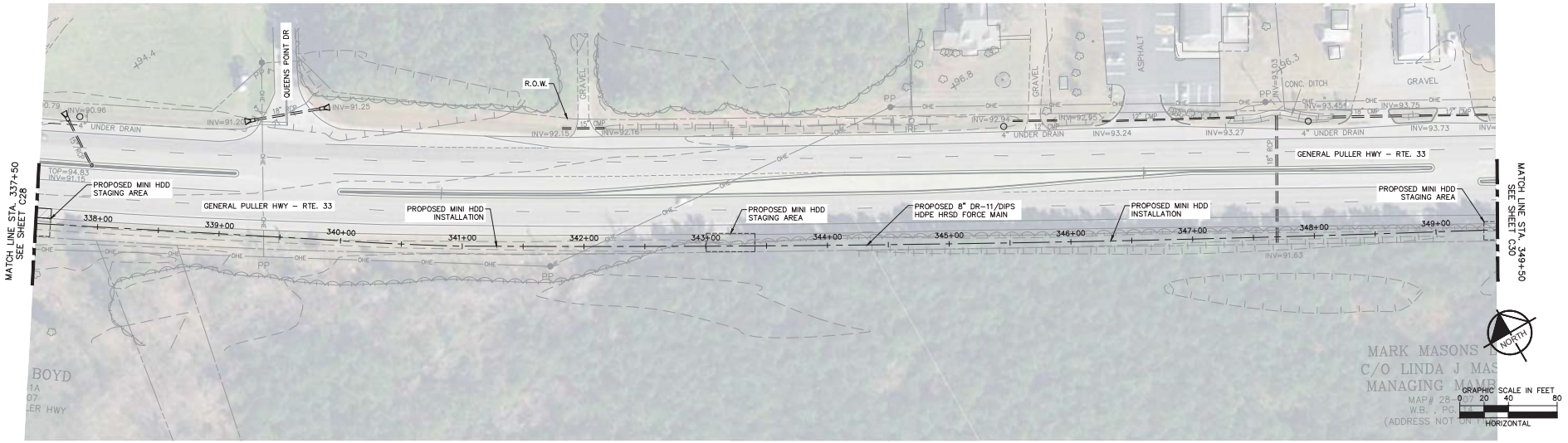
NO.	DATE	BY	REVISION

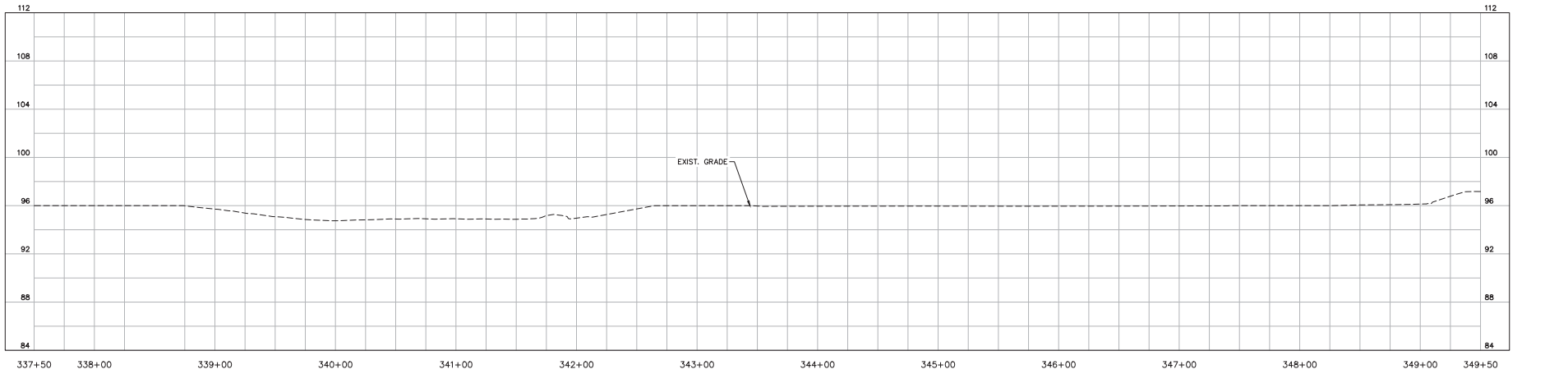
FM Plan and Profile (325+50 - 337+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C28
SCALE:	1" = 40'	SHEET NO.:	30 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

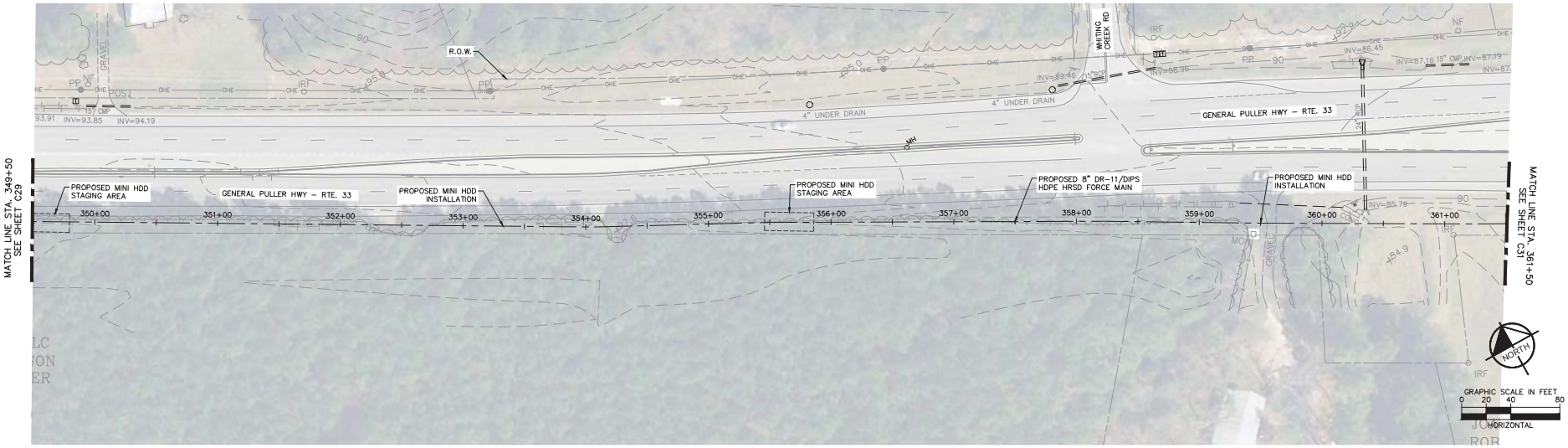
NO.	DATE	BY	REVISION

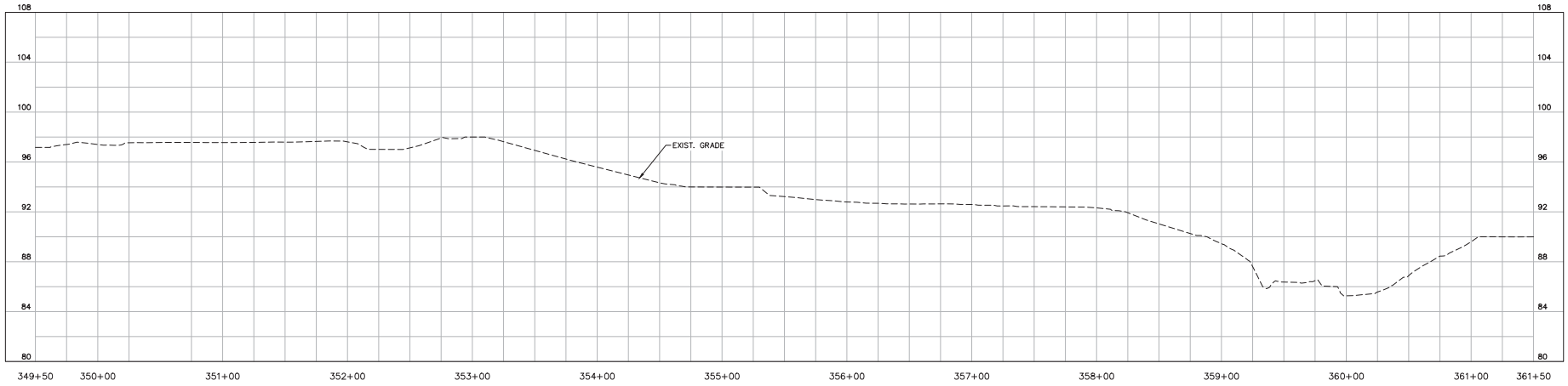
FM Plan and Profile (337+50 - 349+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C29
SCALE:	1" = 40'	SHEET NO.:	31 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

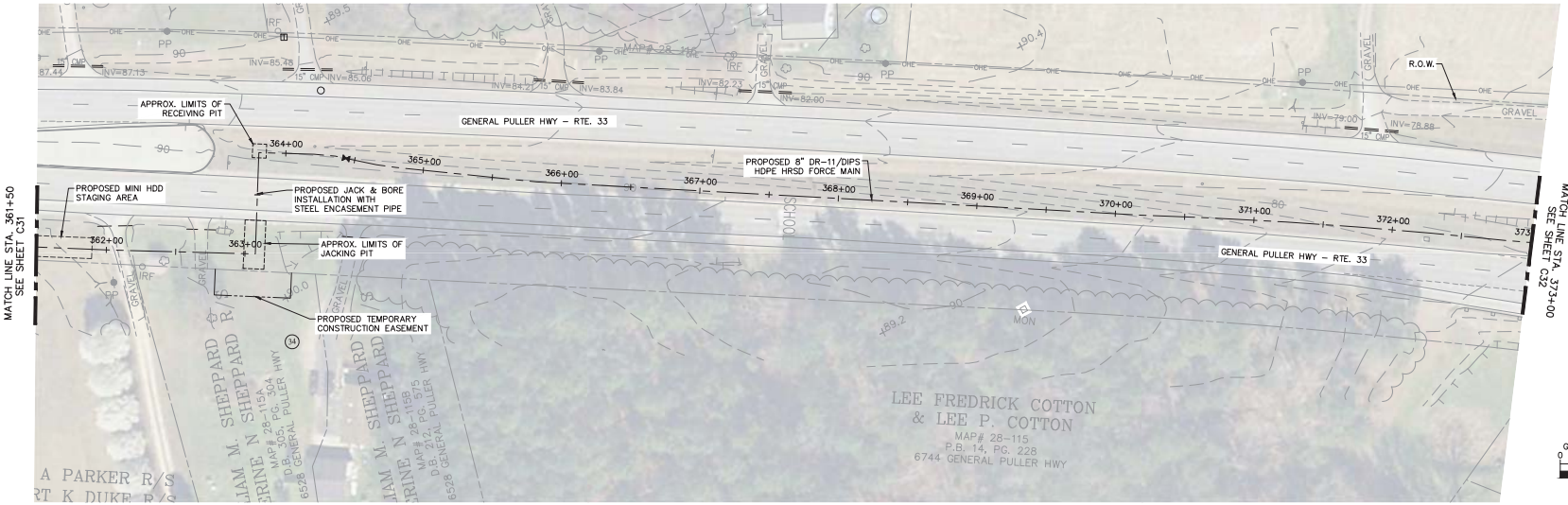
NO.	DATE	BY	REVISION

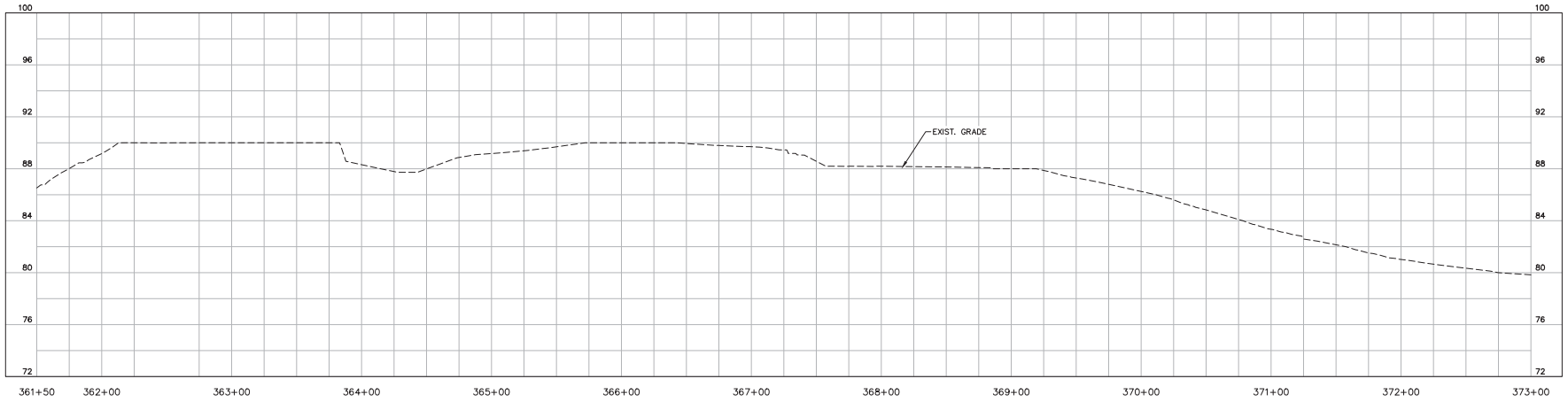
FM Plan and Profile (349+50 - 361+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C30
SCALE:	1" = 40'	SHEET NO.:	32 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

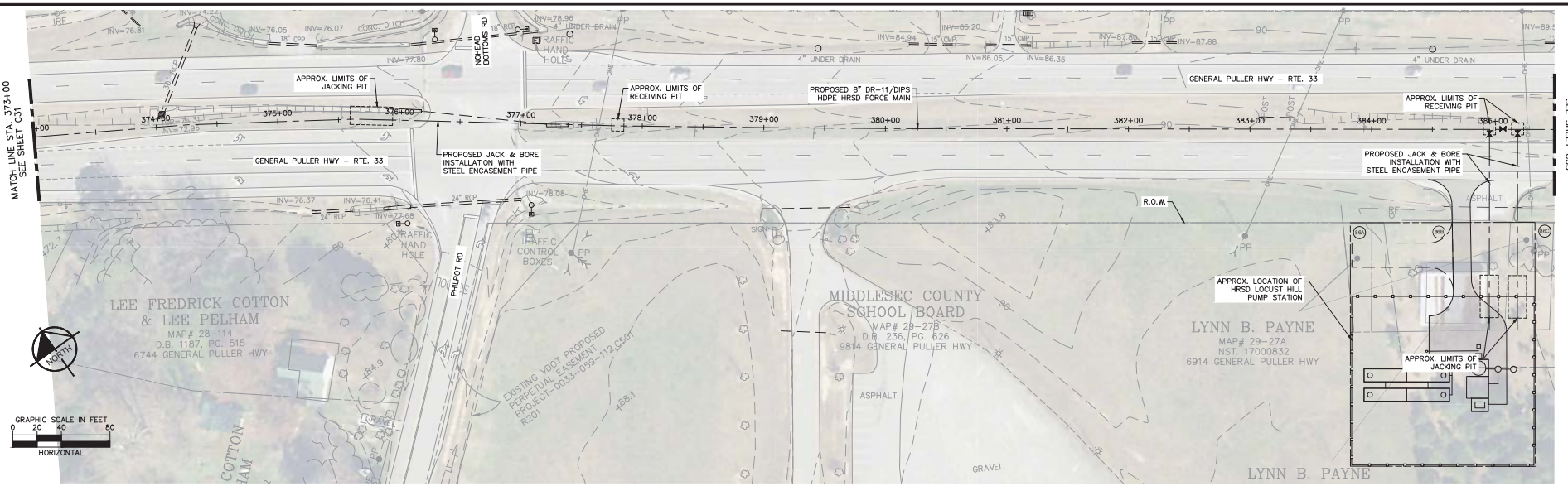
NO.	DATE	BY	REVISION

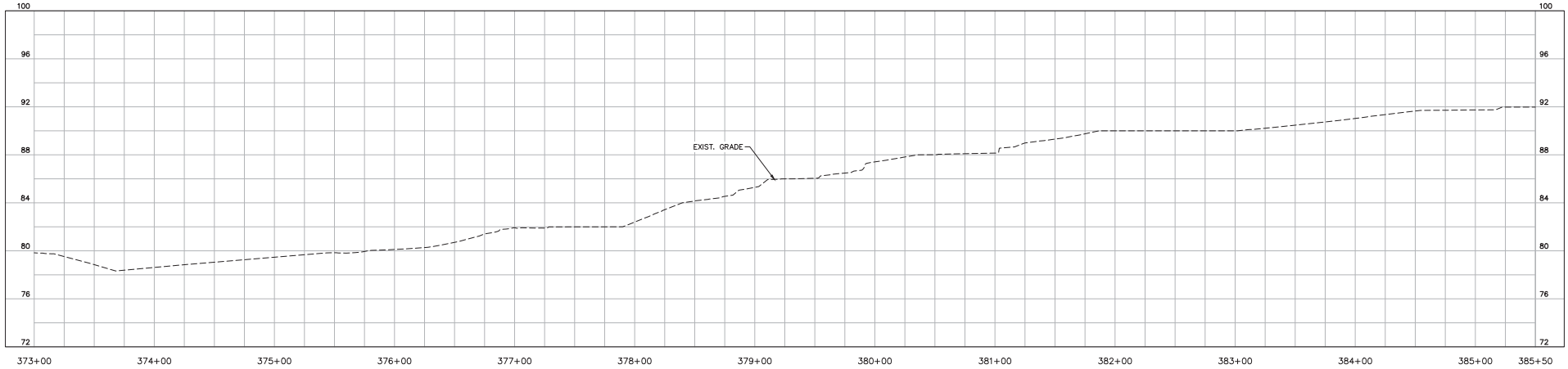
FM Plan and Profile (361+50 - 373+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C31
SCALE:	1" = 40'	SHEET NO.:	33 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

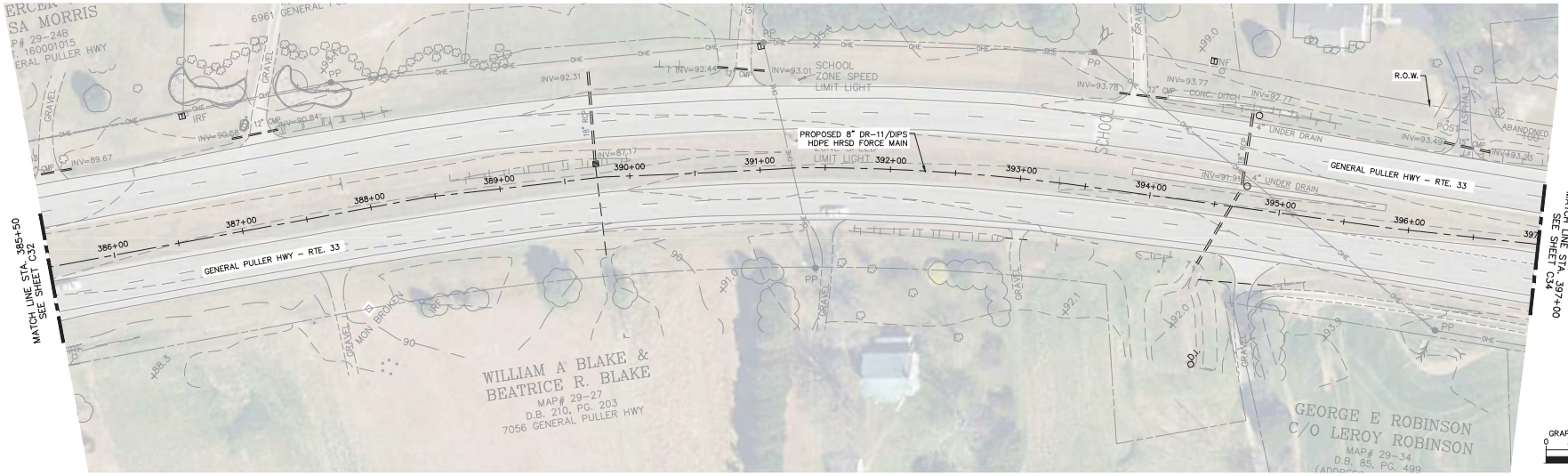
NO.	DATE	BY	REVISION

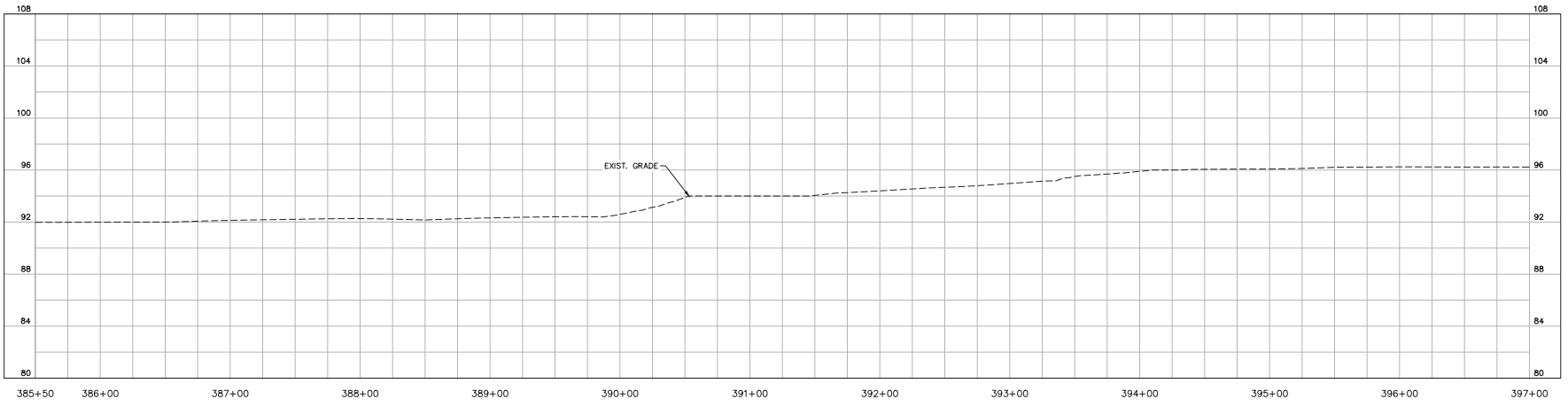
FM Plan and Profile (373+00 - 385+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C32
SCALE:	1" = 40'	SHEET NO.:	34 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

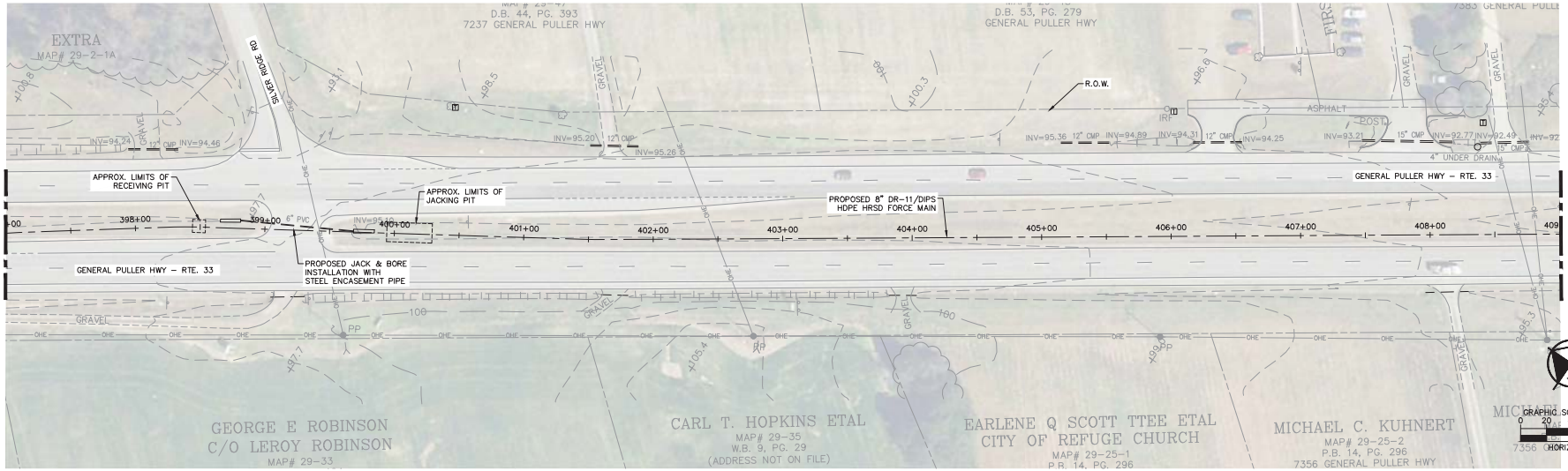
NO.	DATE	BY	REVISION

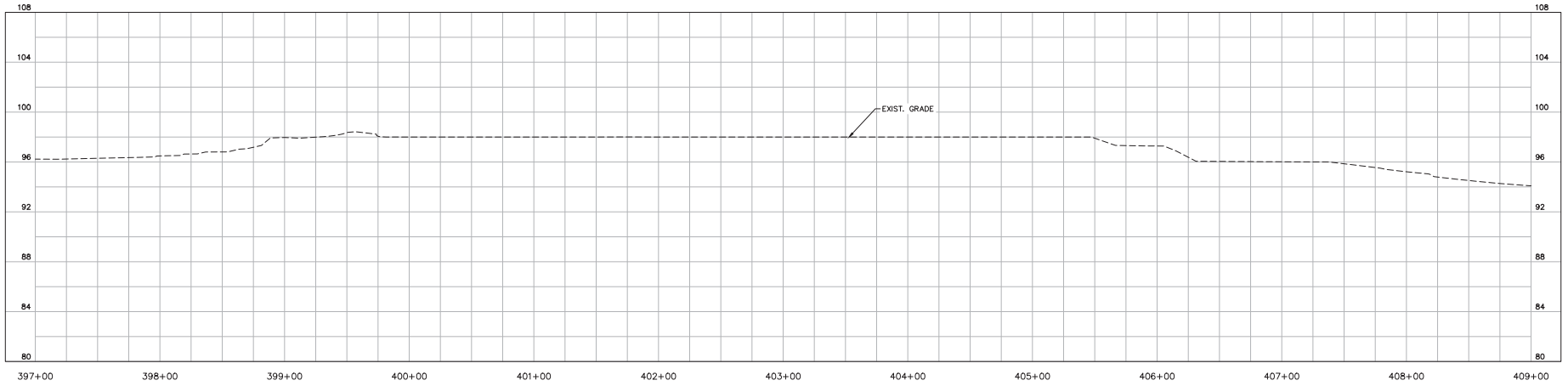
FM Plan and Profile (385+50 - 397+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C33
SCALE:	1" = 40'	SHEET NO.:	35 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

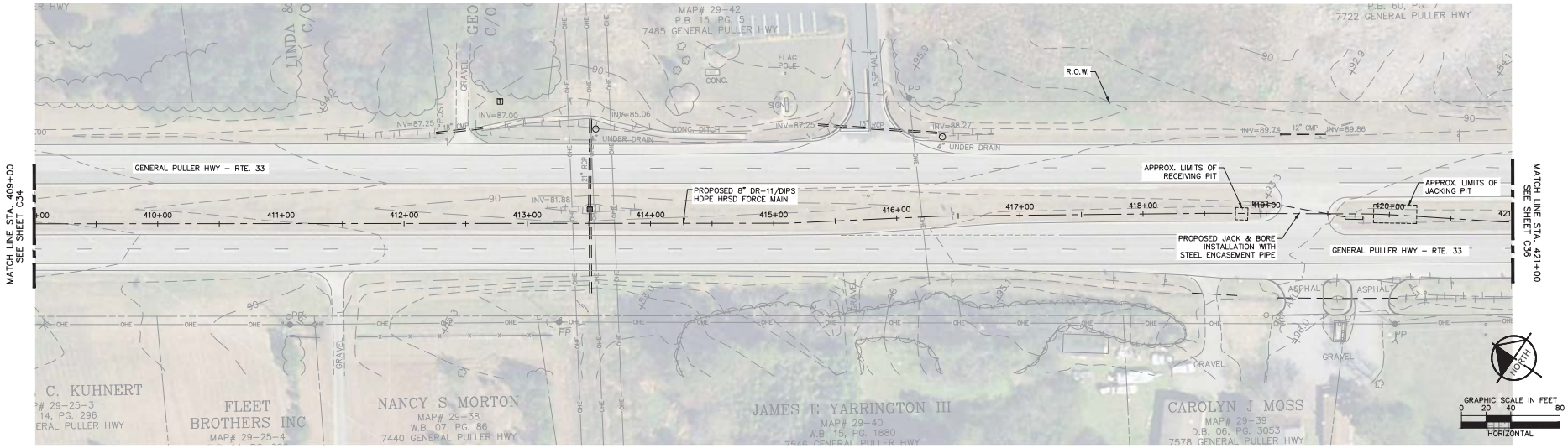
NO.	DATE	BY	REVISION

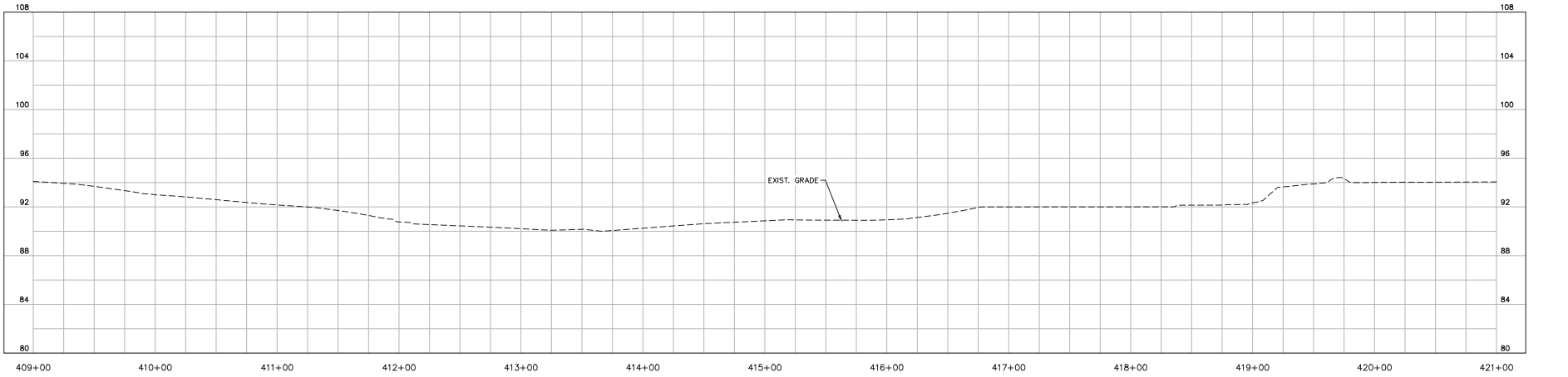
FM Plan and Profile (397+00 - 409+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C34
SCALE:	1" = 40'	SHEET NO.:	36 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

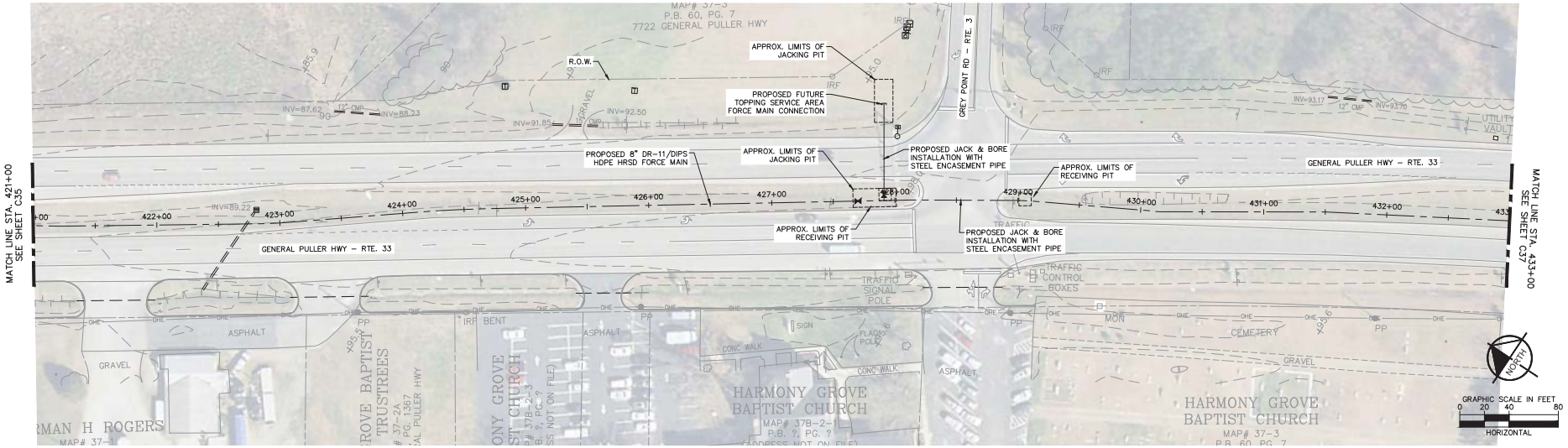
NO.	DATE	BY	REVISION

FM Plan and Profile (409+00 - 421+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C35
SCALE:	1" = 40'	SHEET NO.:	37 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

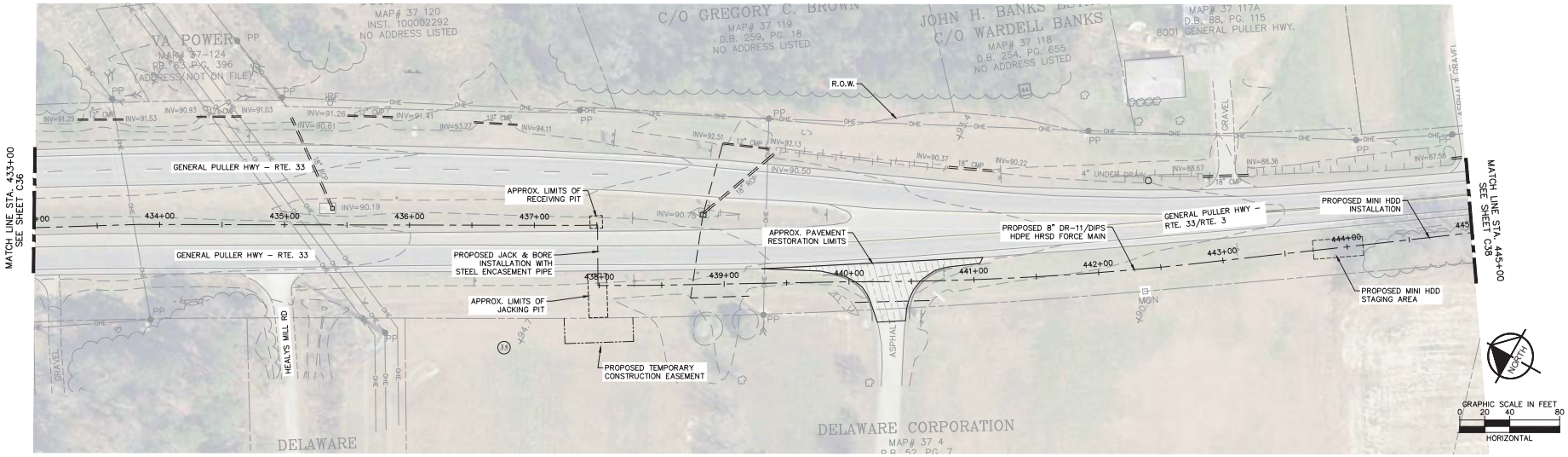
NO.	DATE	BY	REVISION

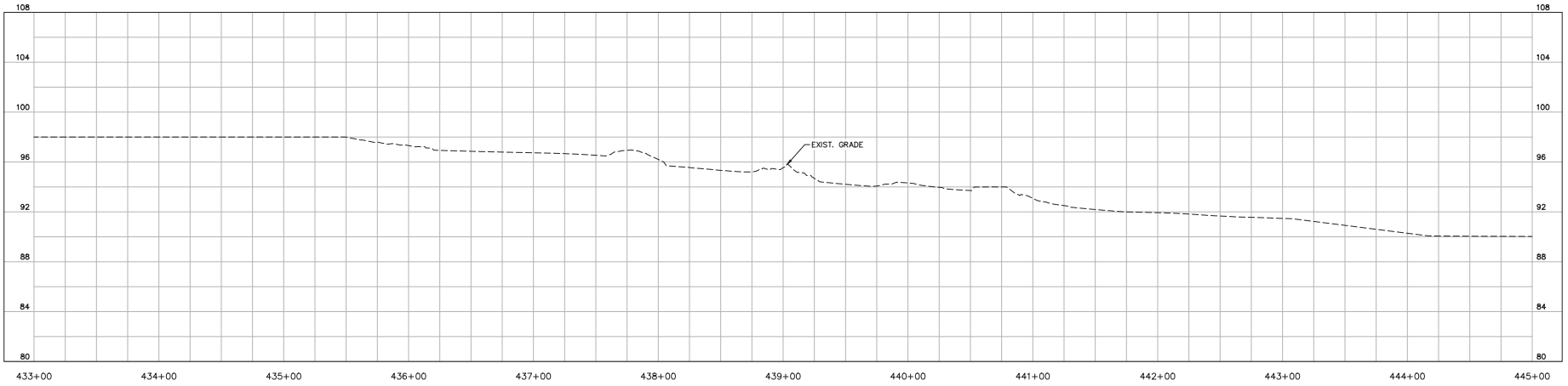
FM Plan and Profile (421+00 - 433+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C36
SCALE:	1" = 40'	SHEET NO.:	38 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

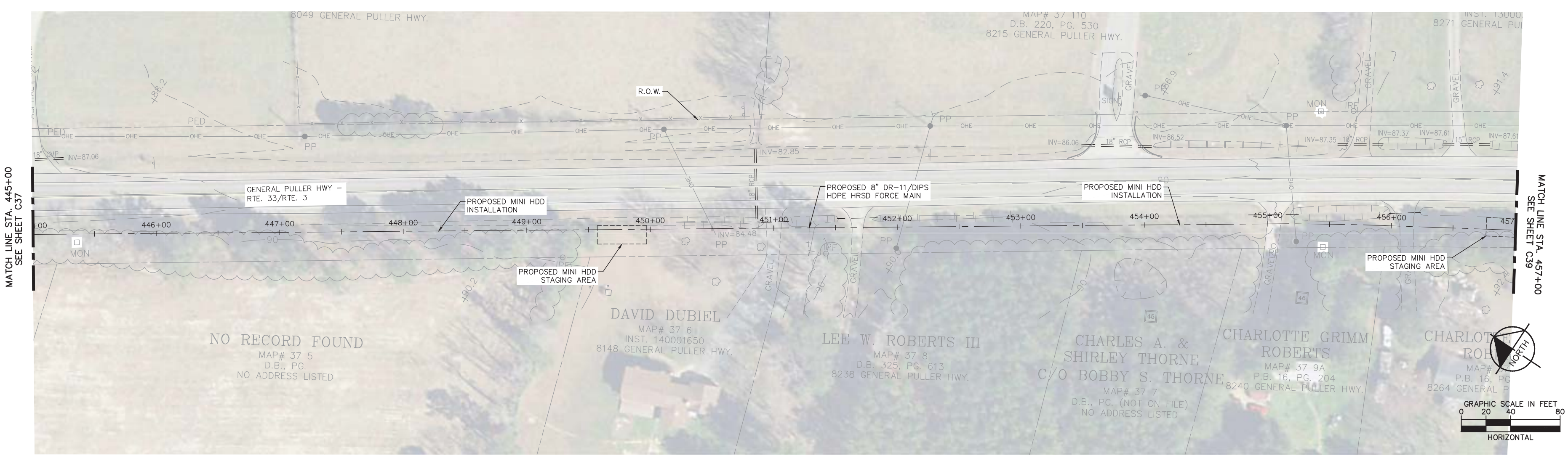
NO.	DATE	BY	REVISION

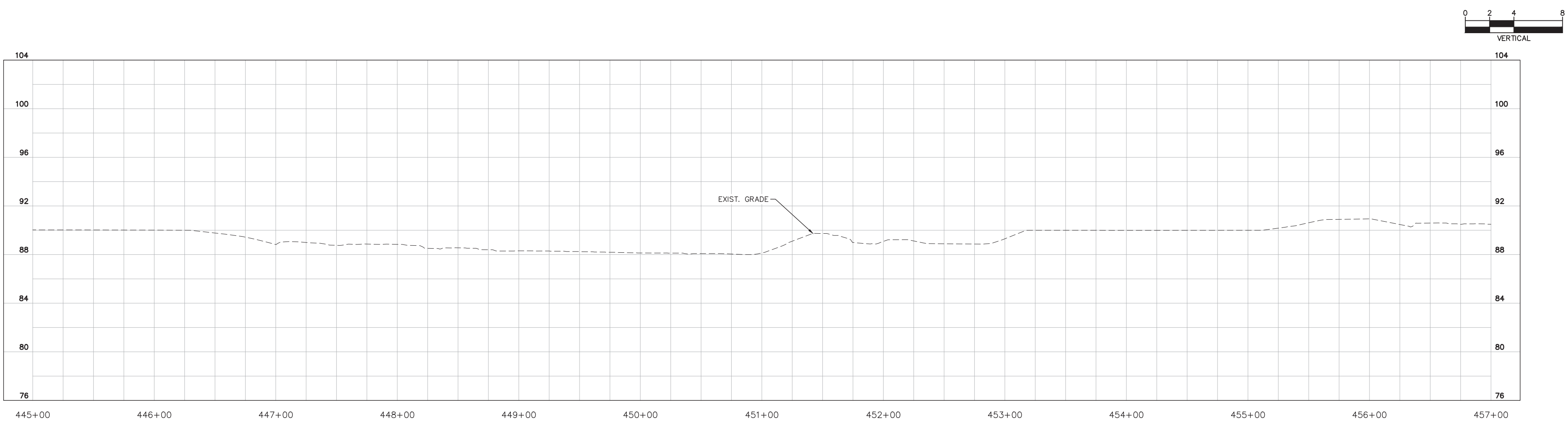
FM Plan and Profile (433+00 - 445+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C37
SCALE:	1" = 40'	SHEET NO.:	39 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

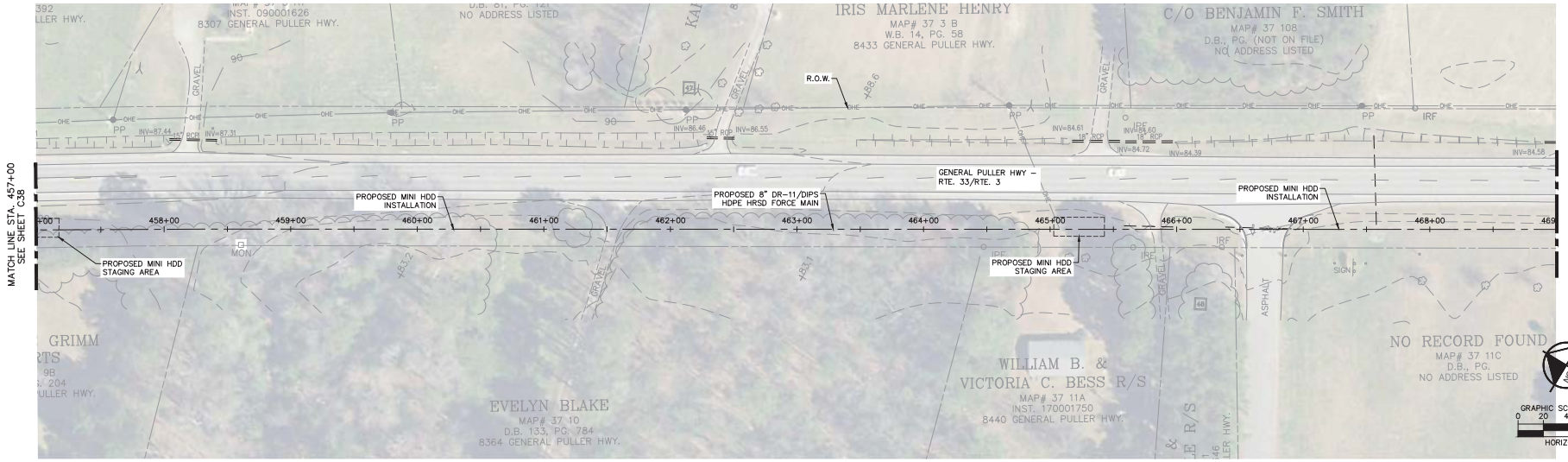
NO.	DATE	BY	REVISION

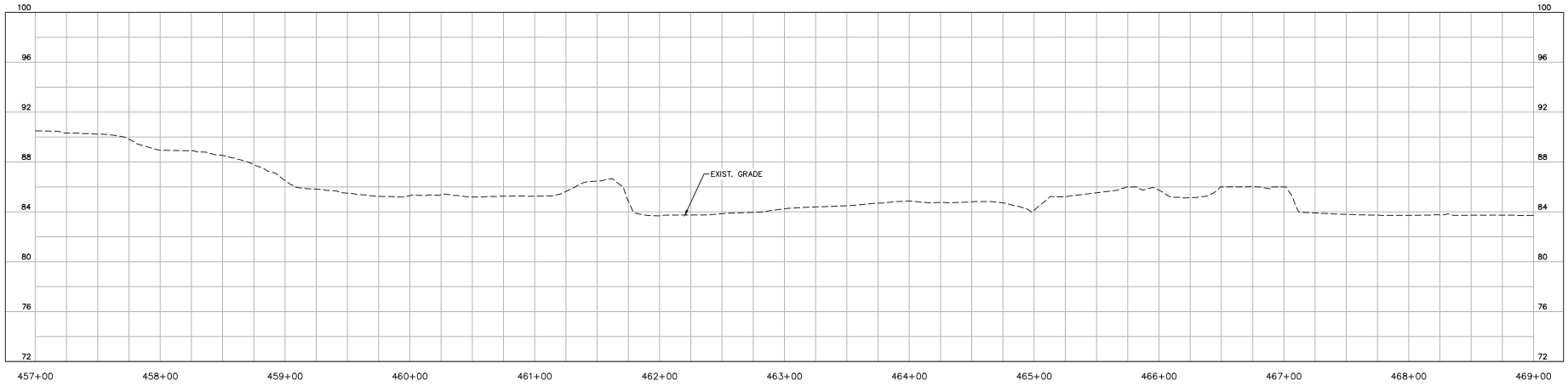
FM Plan and Profile (445+00 - 457+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C38
SCALE:	1" = 40'	SHEET NO.:	40 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

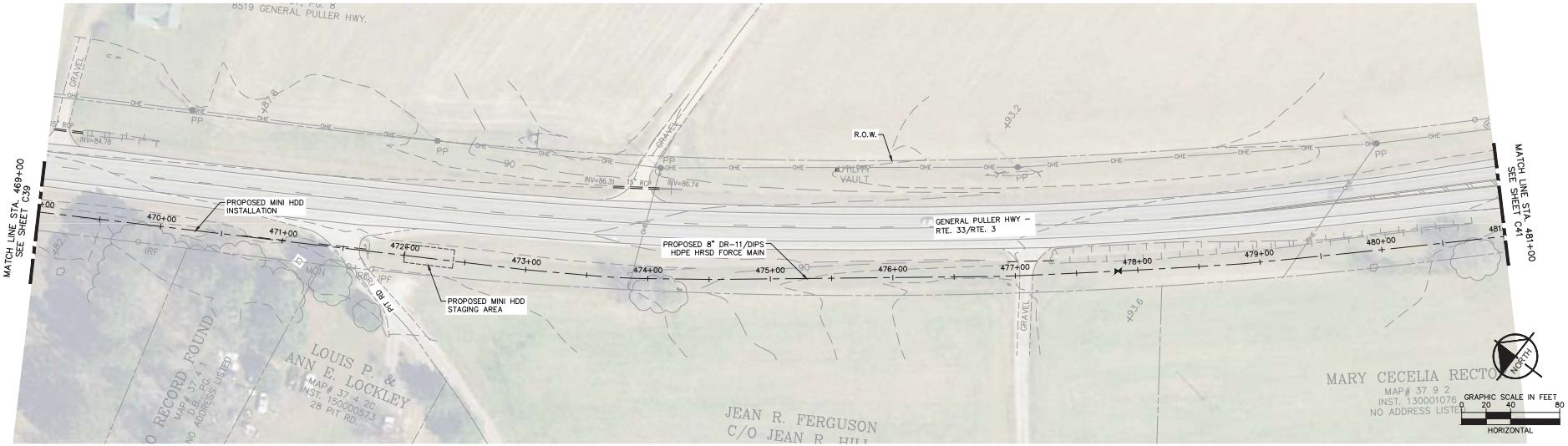
NO.	DATE	BY	REVISION

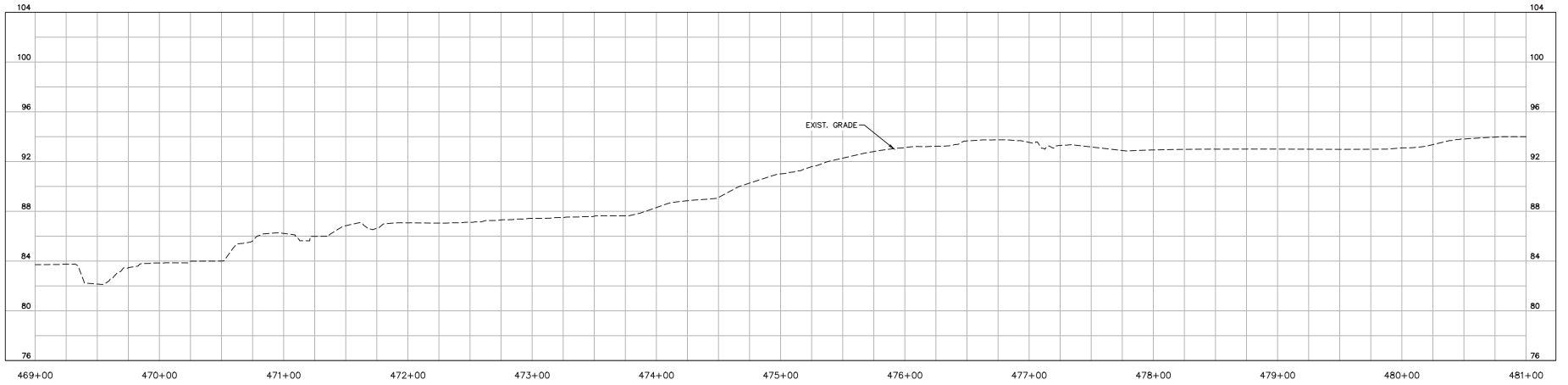
FM Plan and Profile (457+00 - 469+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C39
SCALE:	1" = 40'	SHEET NO.:	41 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

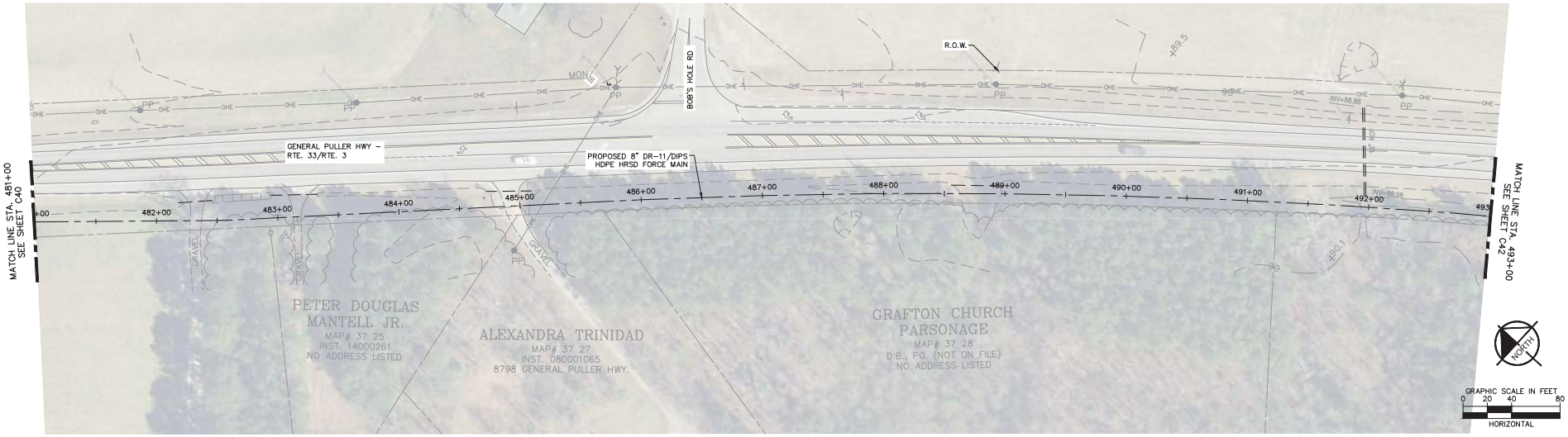
NO.	DATE	BY	REVISION

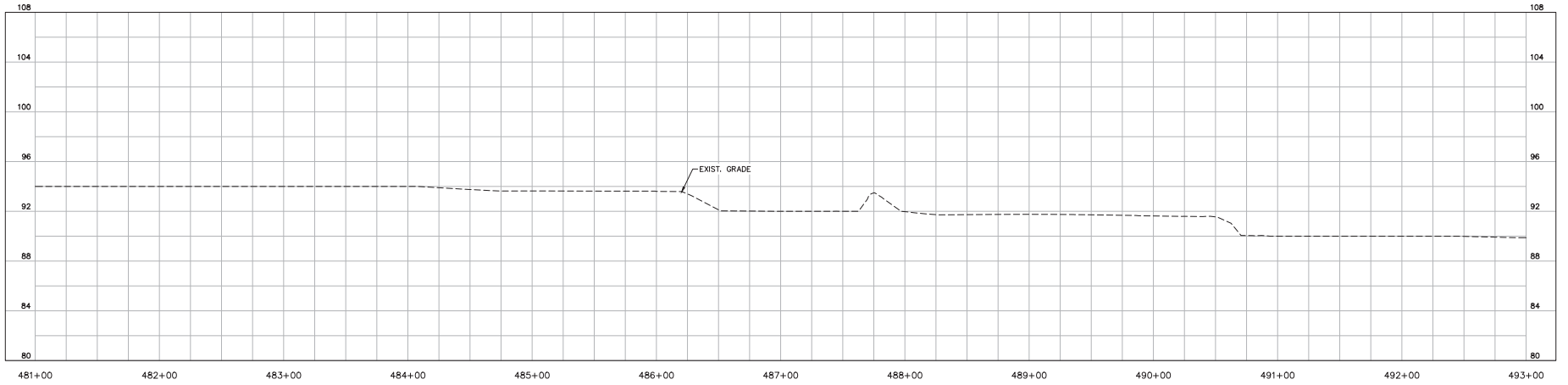
FM Plan and Profile (469+00 - 481+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C40
SCALE:	1" = 40'	SHEET NO.:	42 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

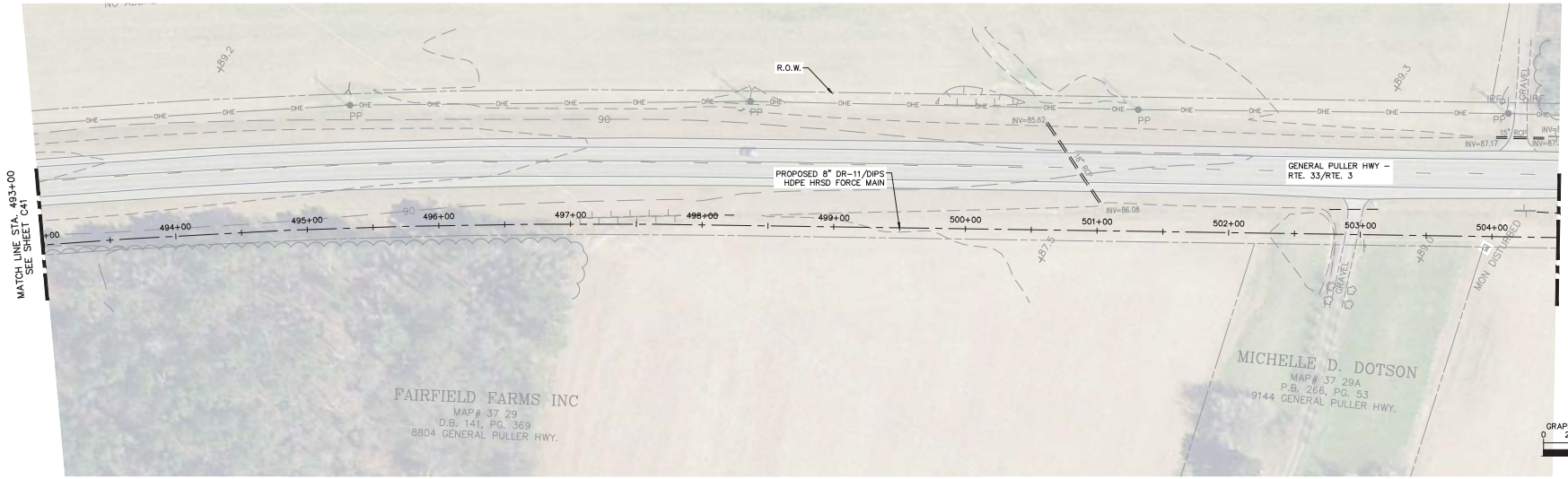
NO.	DATE	BY	REVISION

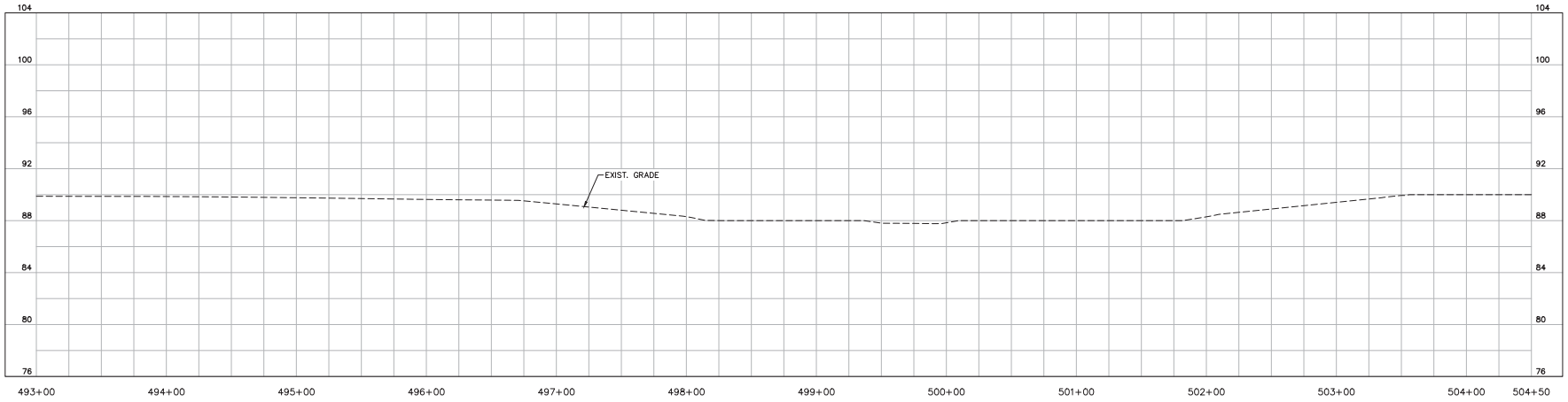
FM Plan and Profile (481+00 - 493+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C41
SCALE:	1" = 40'	SHEET NO.:	43 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

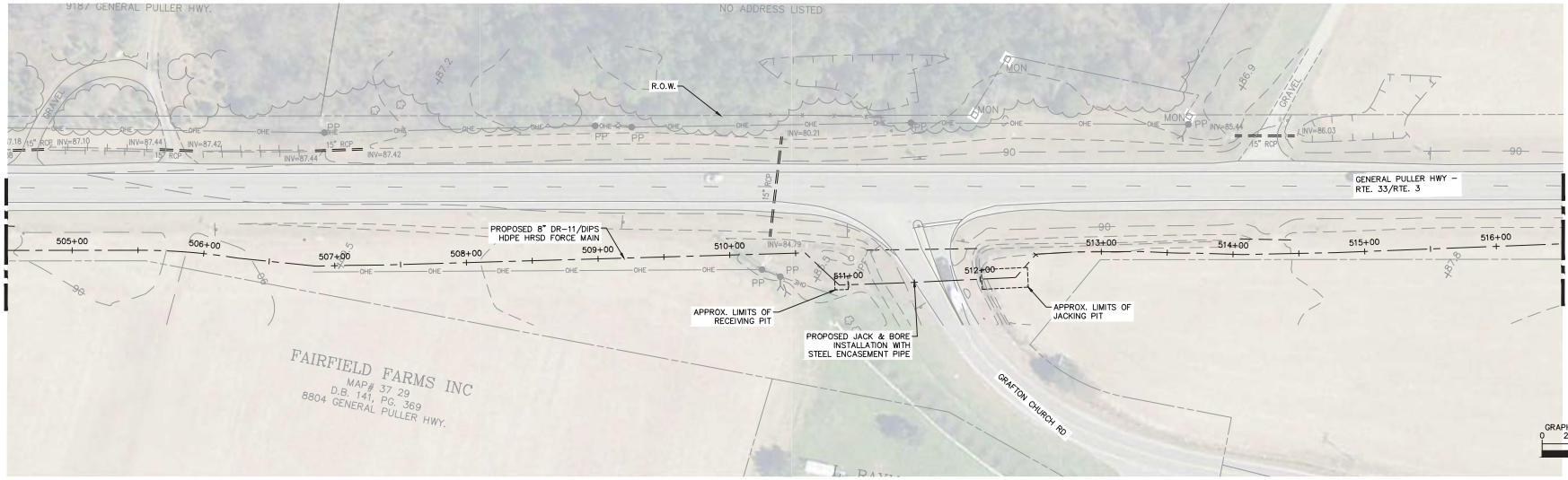
NO.	DATE	BY	REVISION

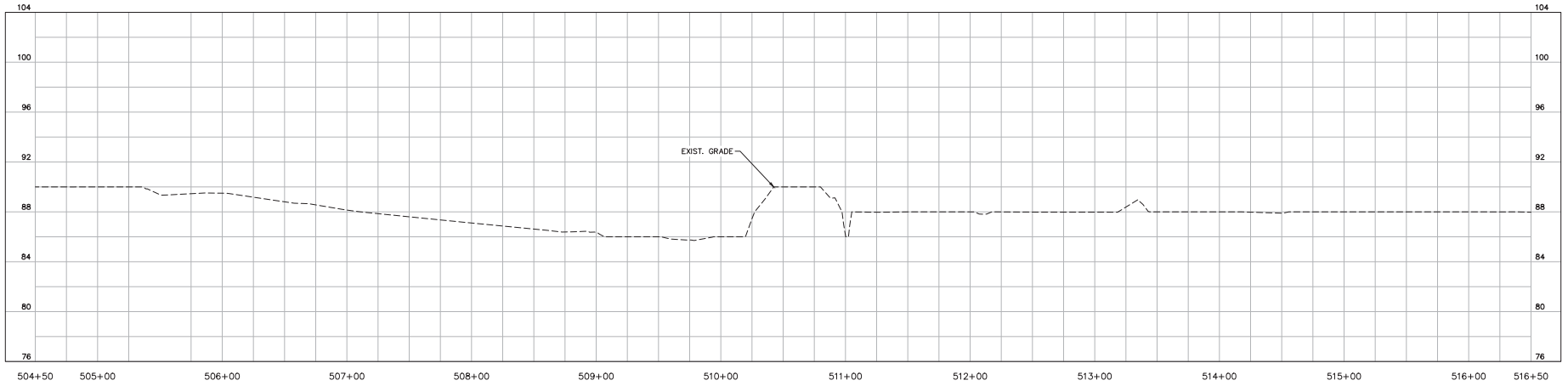
FM Plan and Profile (493+00 - 504+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C42
SCALE:	1" = 40'	SHEET NO.:	44 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

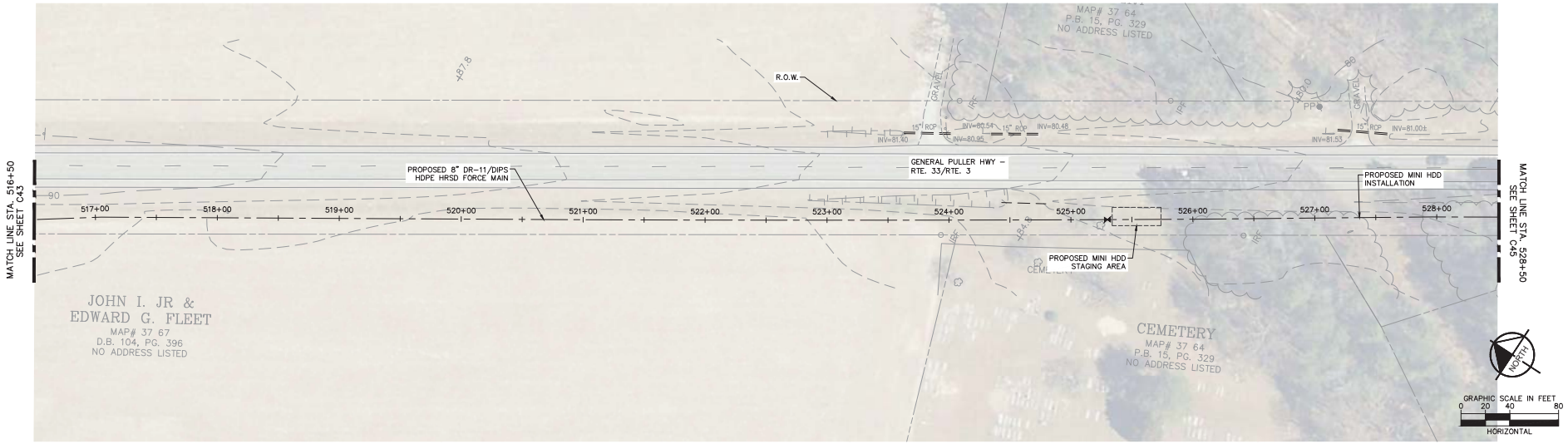
NO.	DATE	BY	REVISION

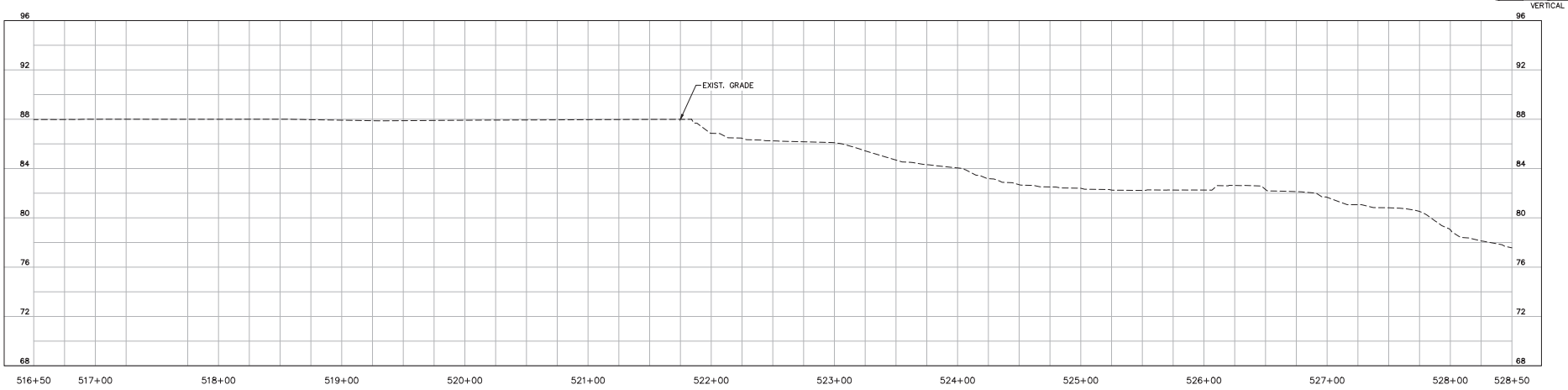
FM Plan and Profile (504+50 - 516+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C43
SCALE:	1" = 40'	SHEET NO.:	45 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

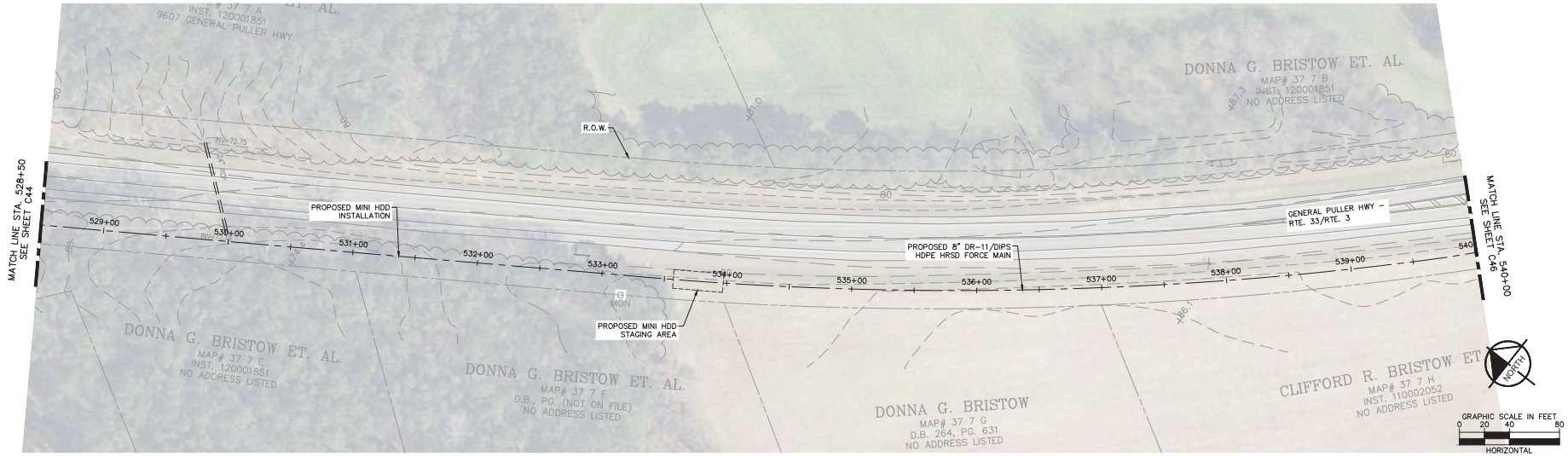
NO.	DATE	BY	REVISION

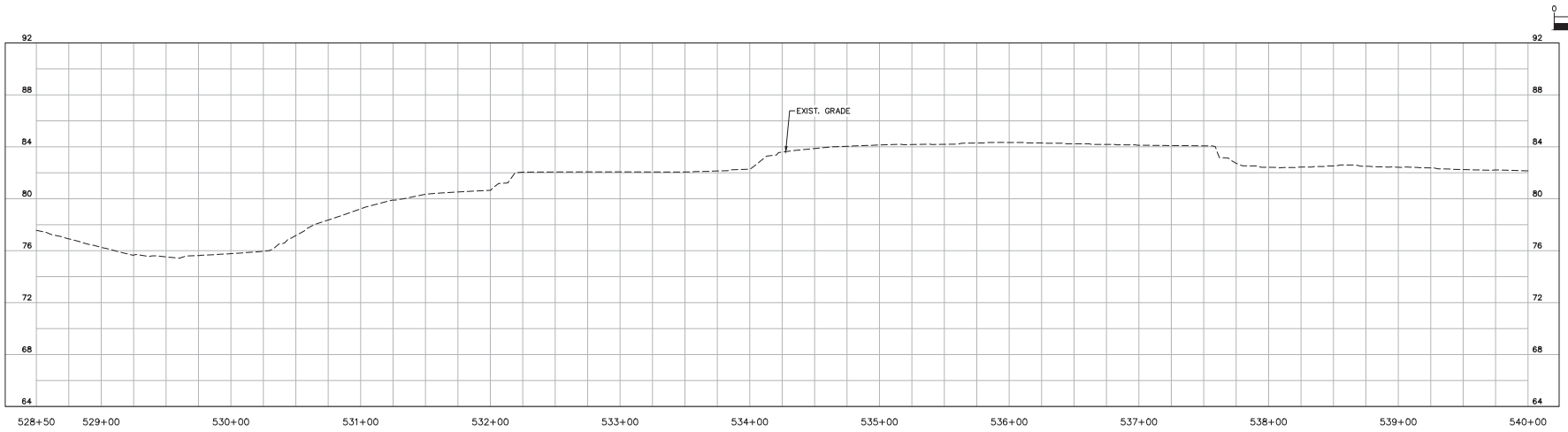
FM Plan and Profile (516+50 - 528+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C44
SCALE:	1" = 40'	SHEET NO.:	46 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

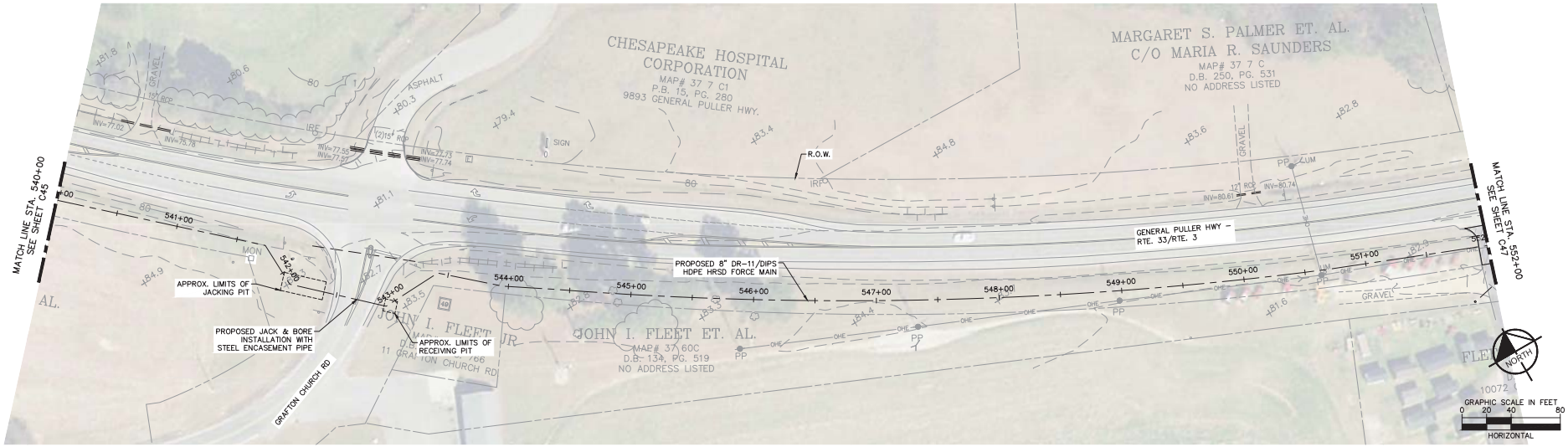
NO.	DATE	BY	REVISION

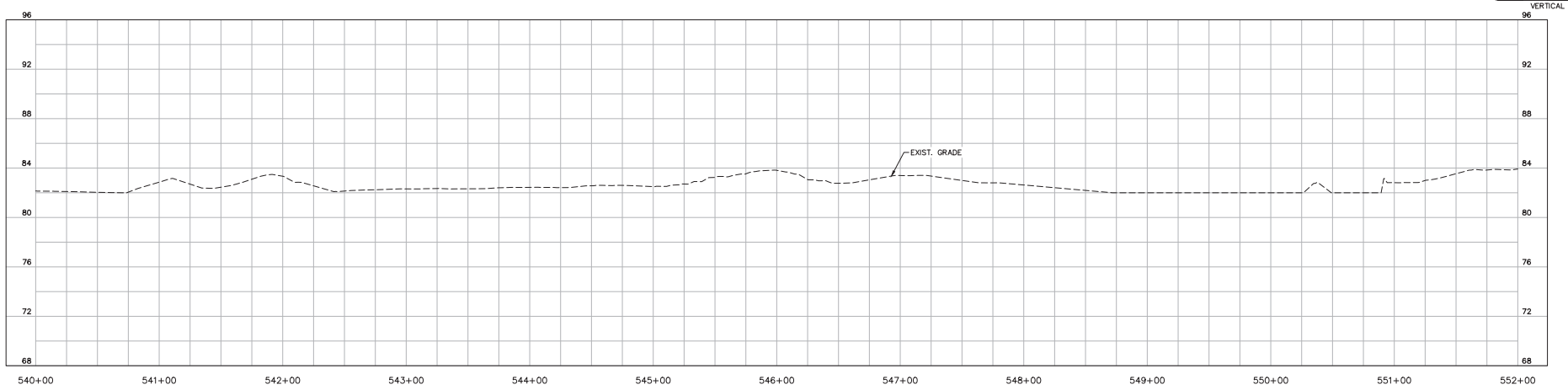
FM Plan and Profile (528+50 - 540+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C45
SCALE:	1" = 40'	SHEET NO.:	47 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

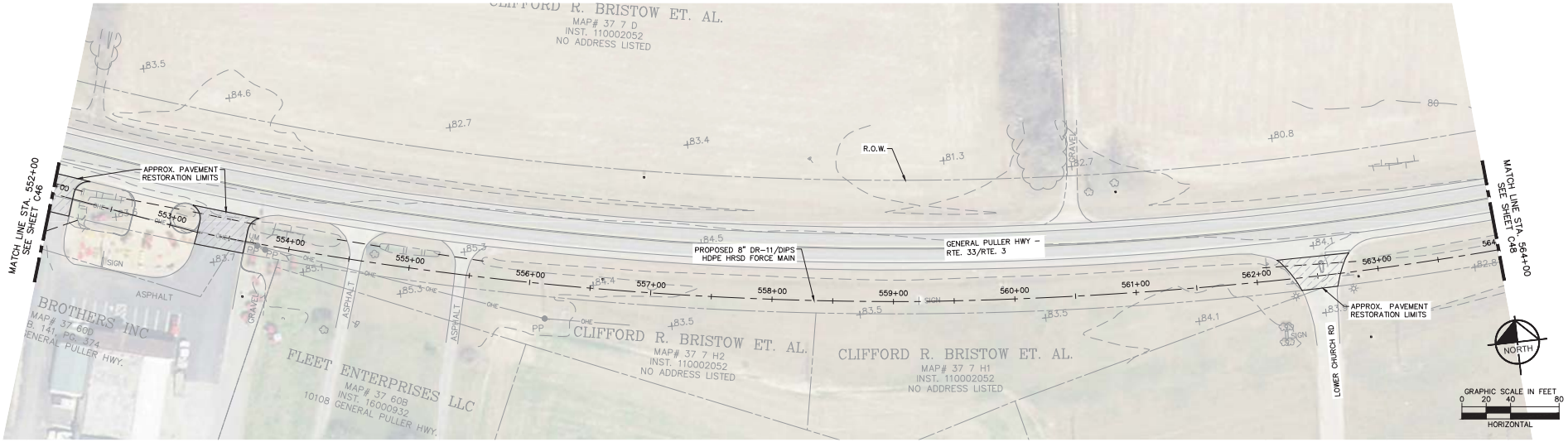
NO.	DATE	BY	REVISION

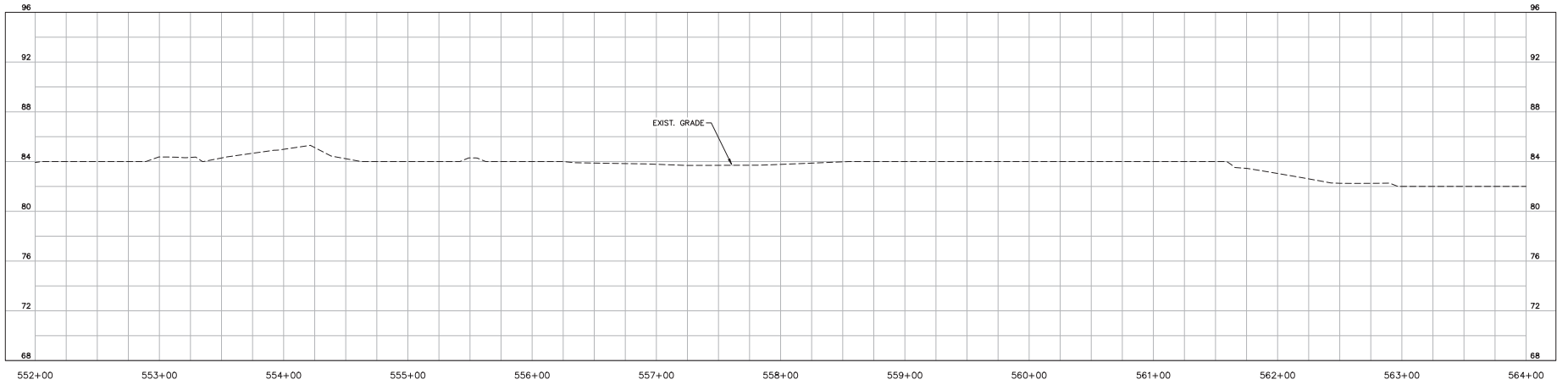
FM Plan and Profile (540+00 - 552+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C46
SCALE:	1" = 40'	SHEET NO.:	48 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

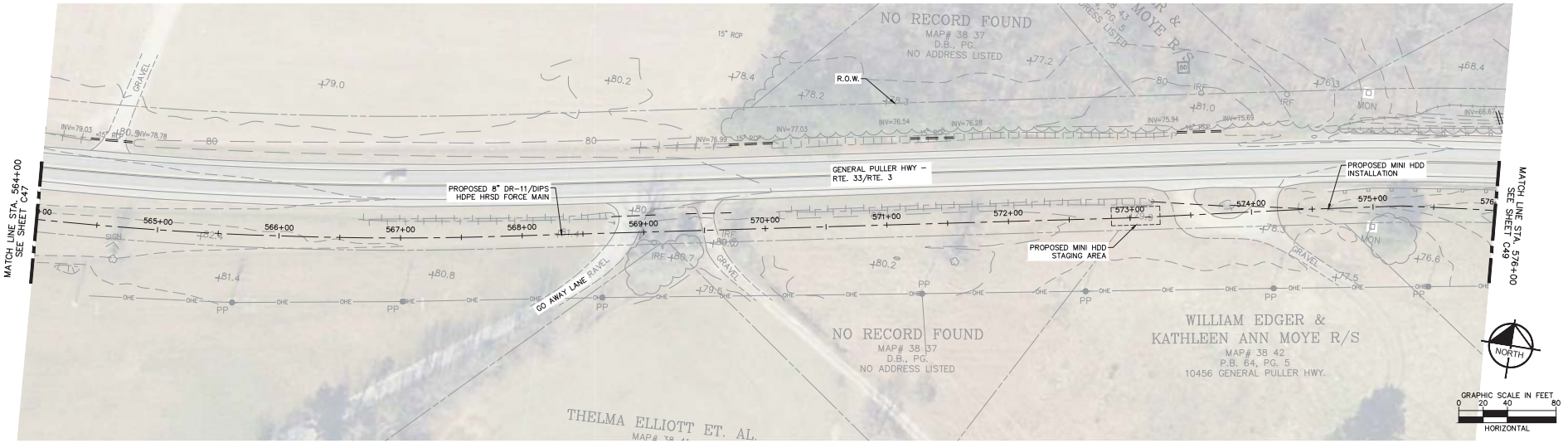
NO.	DATE	BY	REVISION

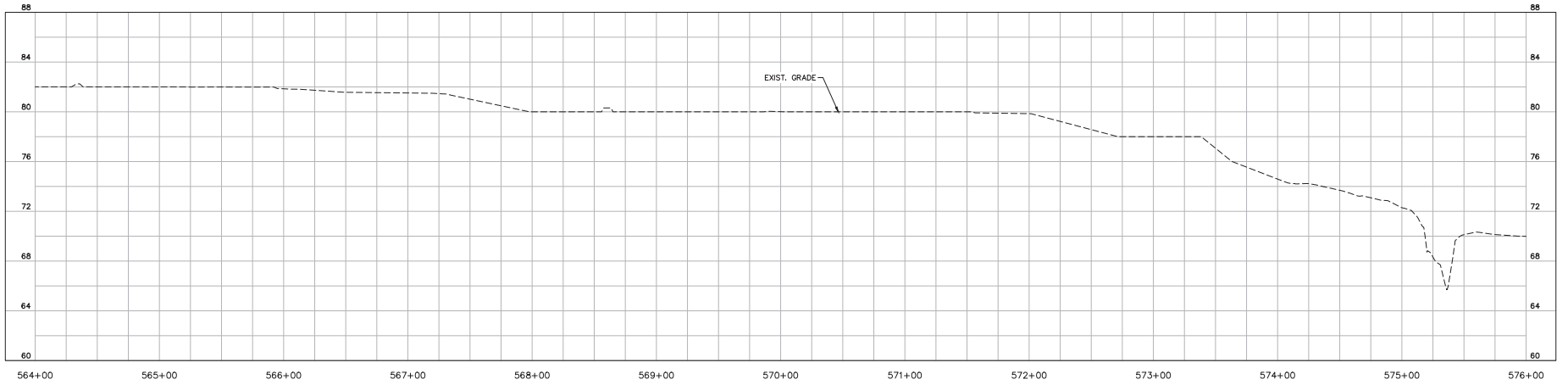
FM Plan and Profile (552+00 - 564+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C47
SCALE:	1" = 40'	SHEET NO.:	48 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

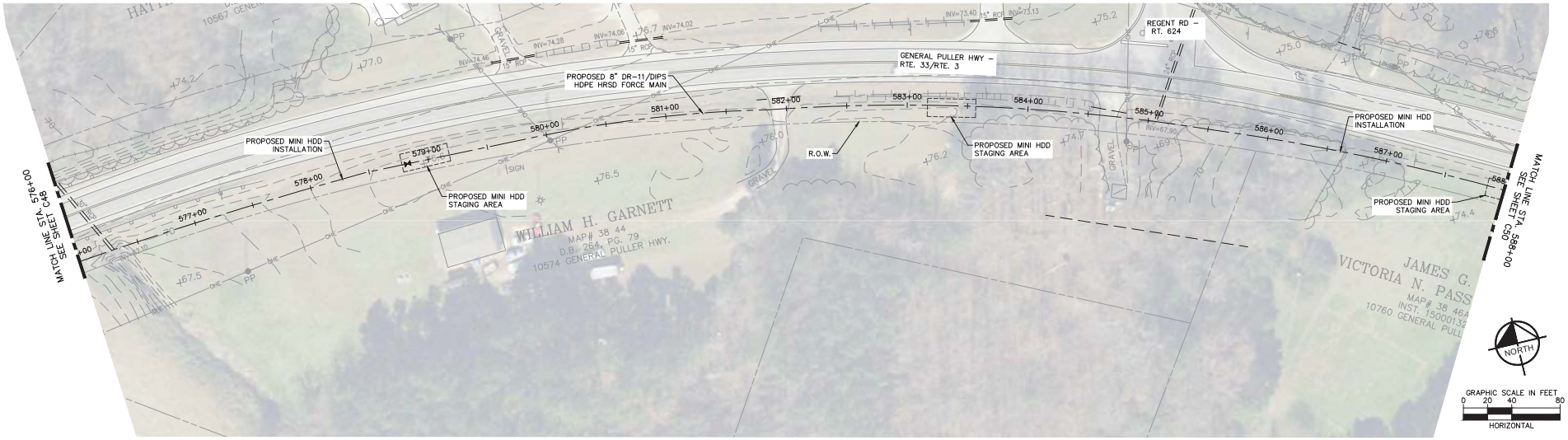
NO.	DATE	BY	REVISION

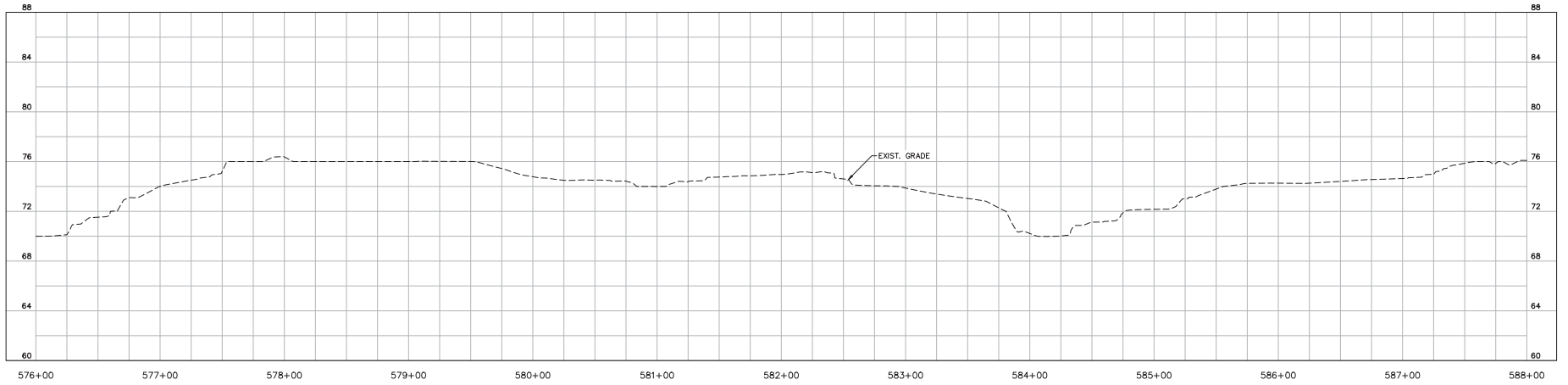
FM Plan and Profile (564+00 - 576+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C48
SCALE:	1" = 40'	SHEET NO.:	50 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. #######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

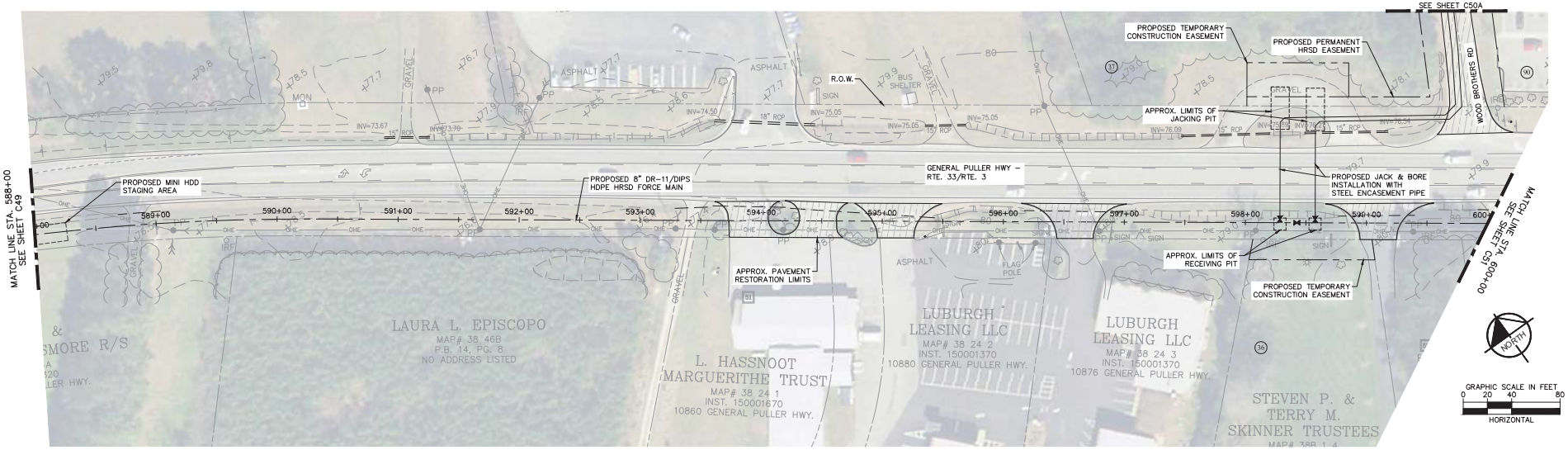
NO.	DATE	BY	REVISION

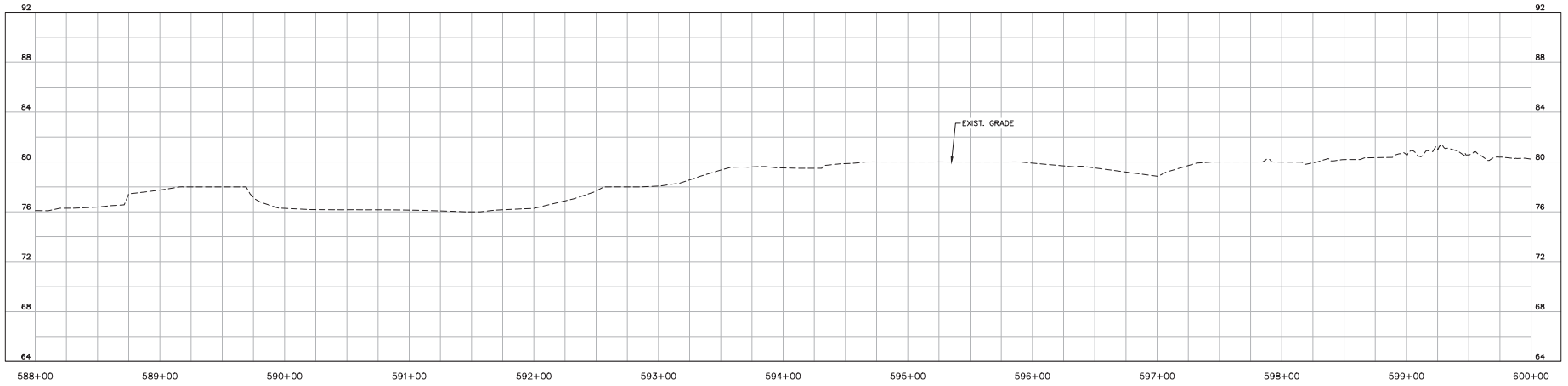
FM Plan and Profile (576+00 - 588+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C49
SCALE:	1" = 40'	SHEET NO.:	51 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FM Plan and Profile (588+00 - 600+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C50
SCALE:	1" = 40'	SHEET NO.:	52 of 77

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

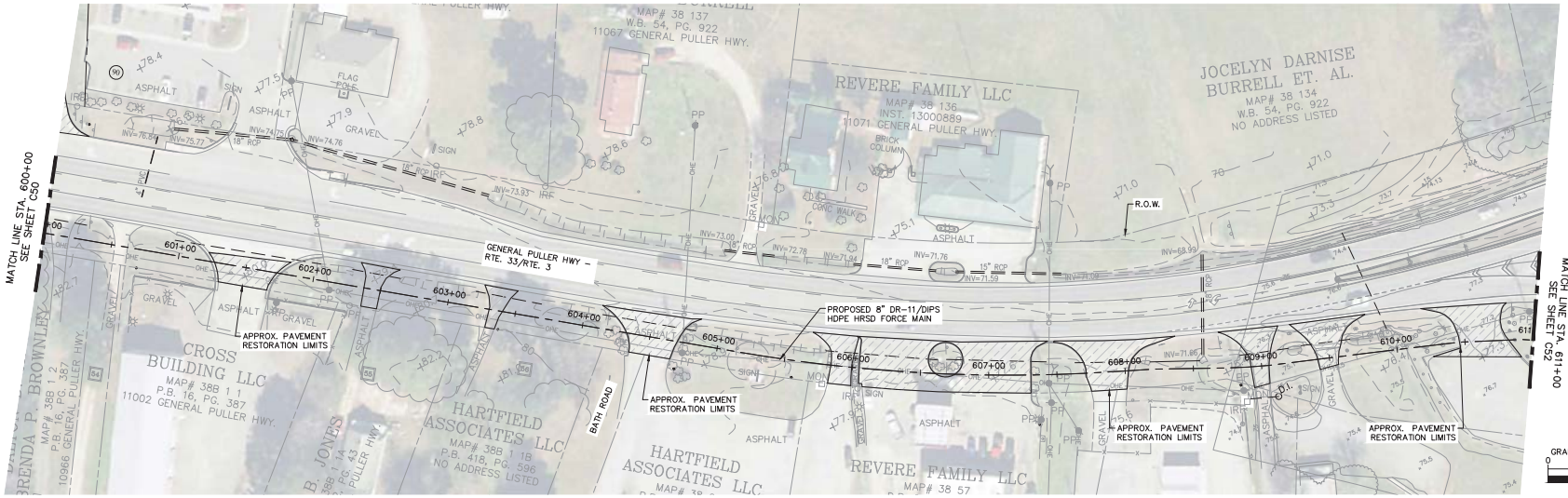
NO.	DATE	BY	REVISION

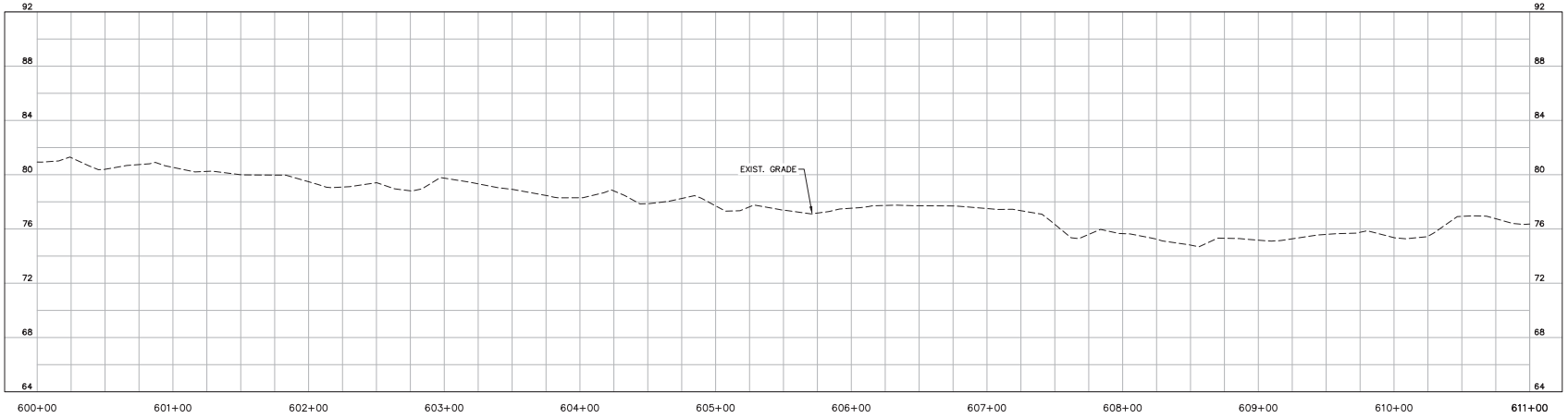
Hartfield Pump Station

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C50A
SCALE:	1" = 40'	SHEET NO.:	53 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

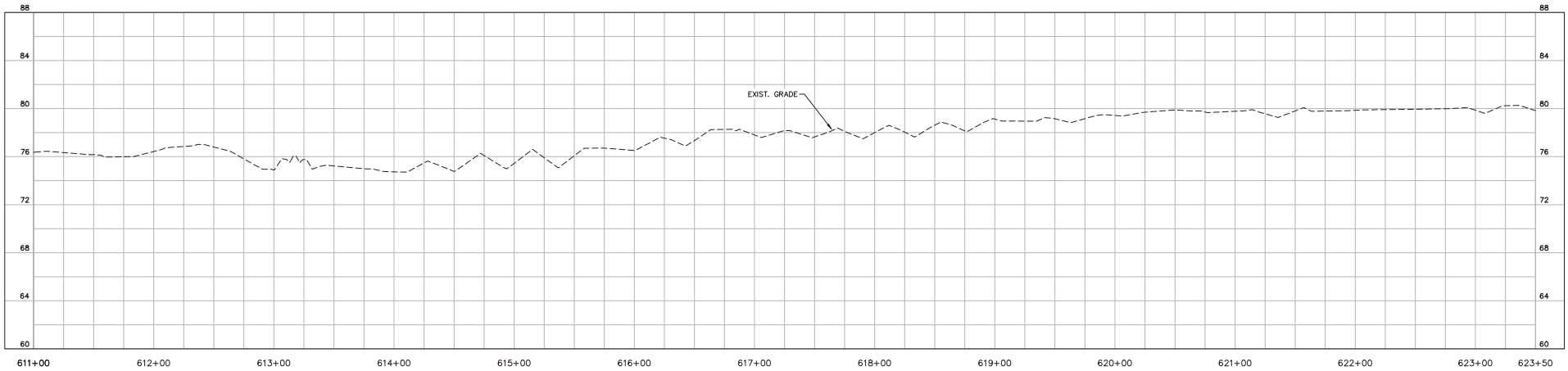
NO.	DATE	BY	REVISION

FM Plan and Profile (600+00 - 611+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C51
SCALE:	1" = 40'	SHEET NO.:	54 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

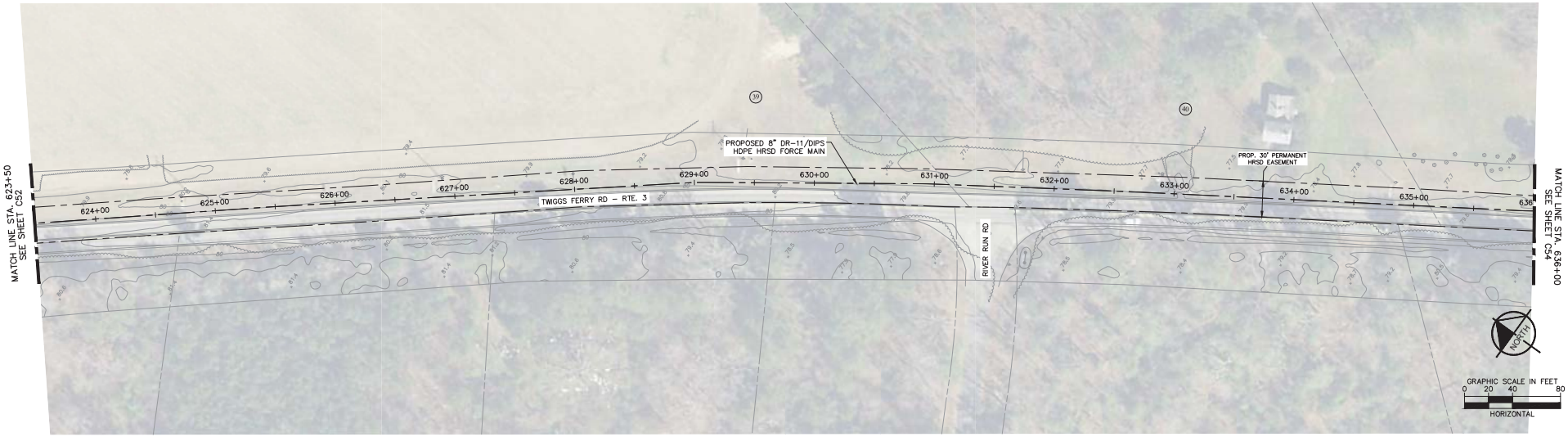
NO.	DATE	BY	REVISION

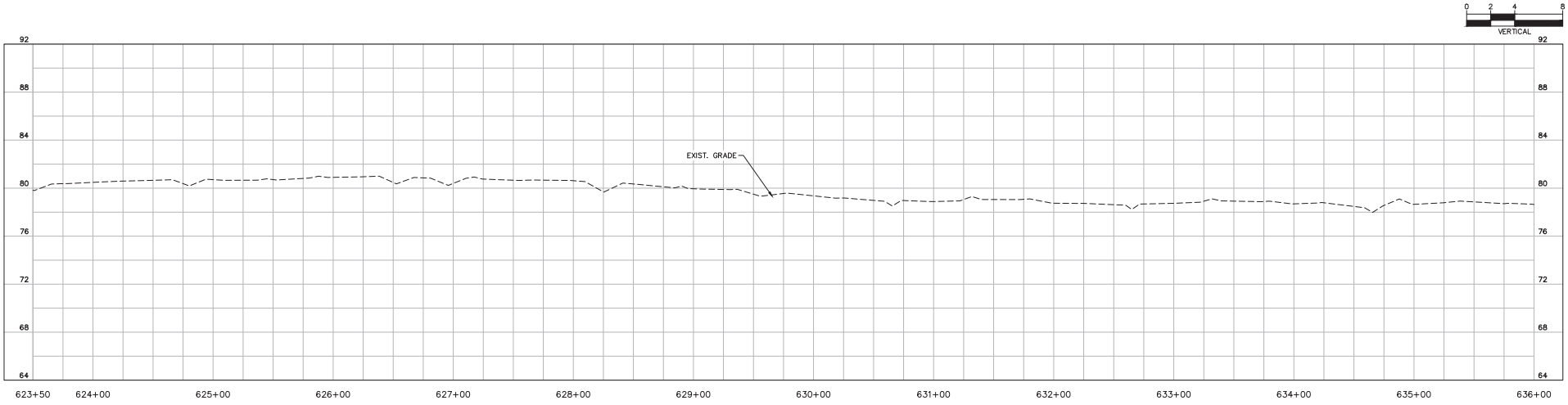
FM Plan and Profile (611+00 - 623+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C52
SCALE:	1" = 40'	SHEET NO.:	55 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

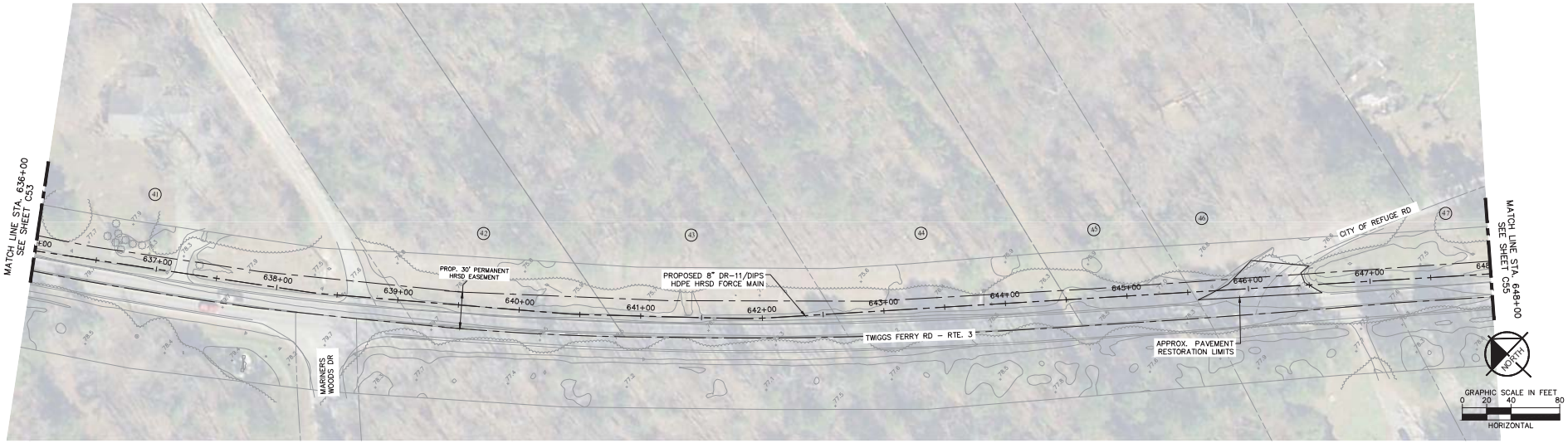
NO.	DATE	BY	REVISION

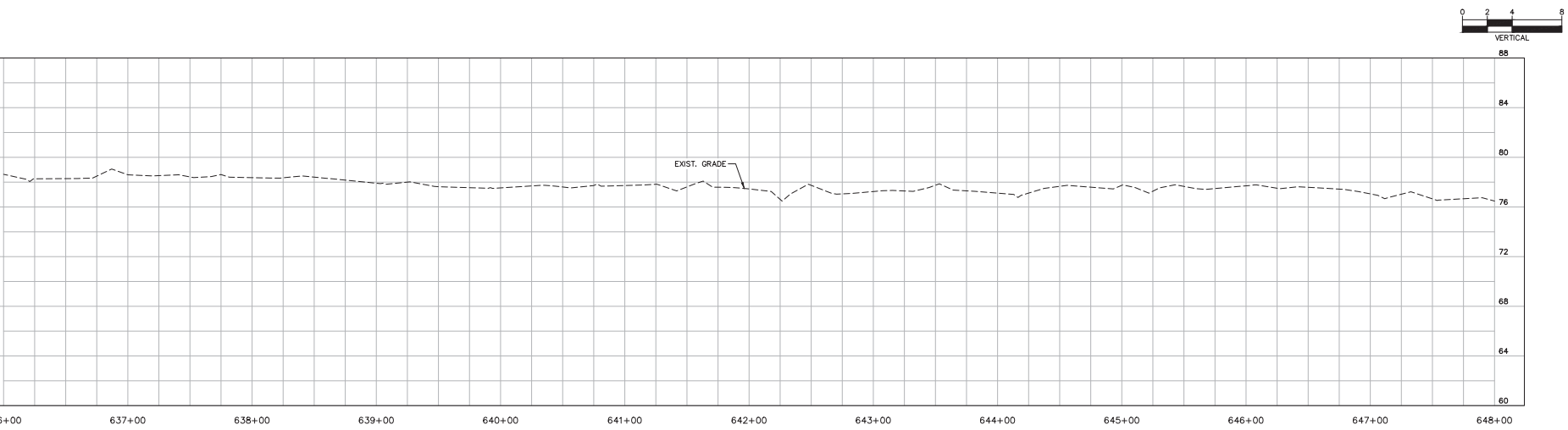
FM Plan and Profile (623+50 - 636+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C53
SCALE:	1" = 40'	SHEET NO.:	56 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

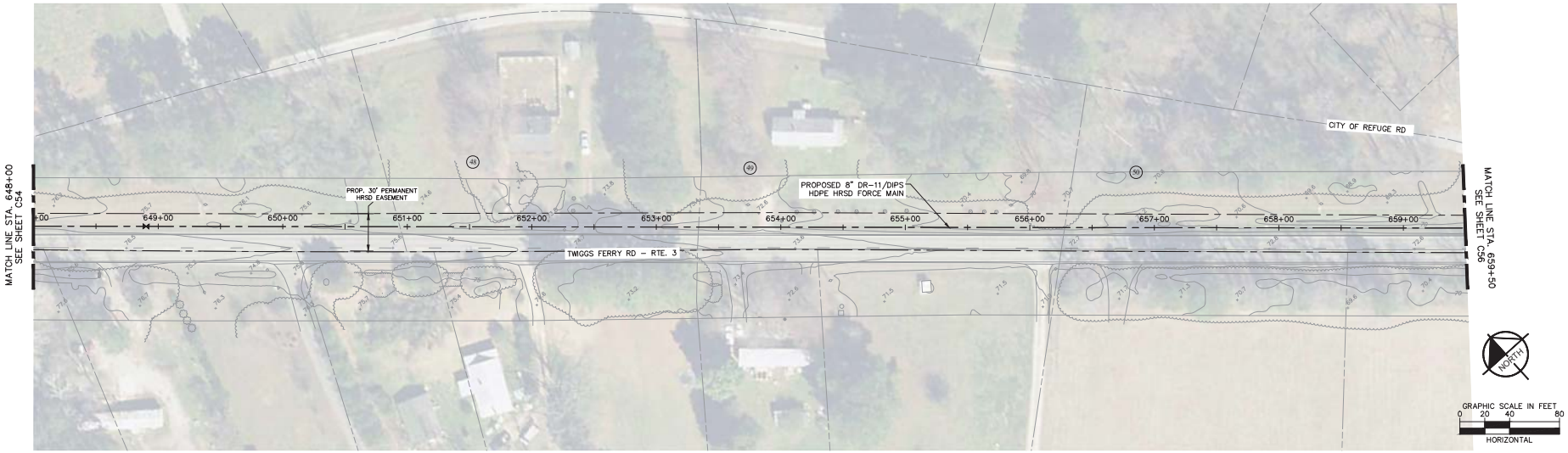
NO.	DATE	BY	REVISION

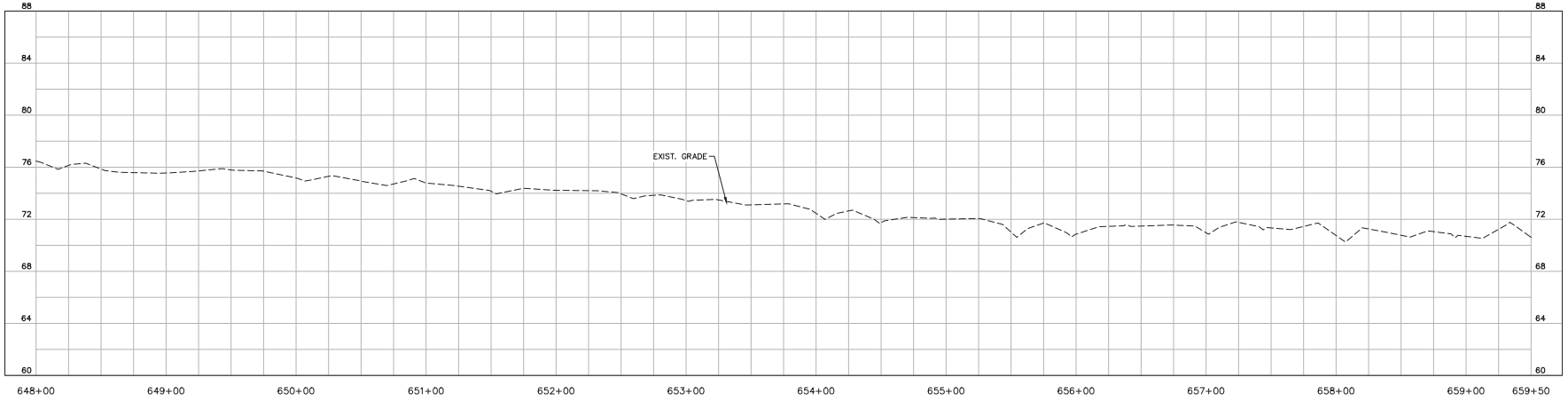
FM Plan and Profile (636+00 - 648+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C54
SCALE:	1" = 40'	SHEET NO.:	57 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

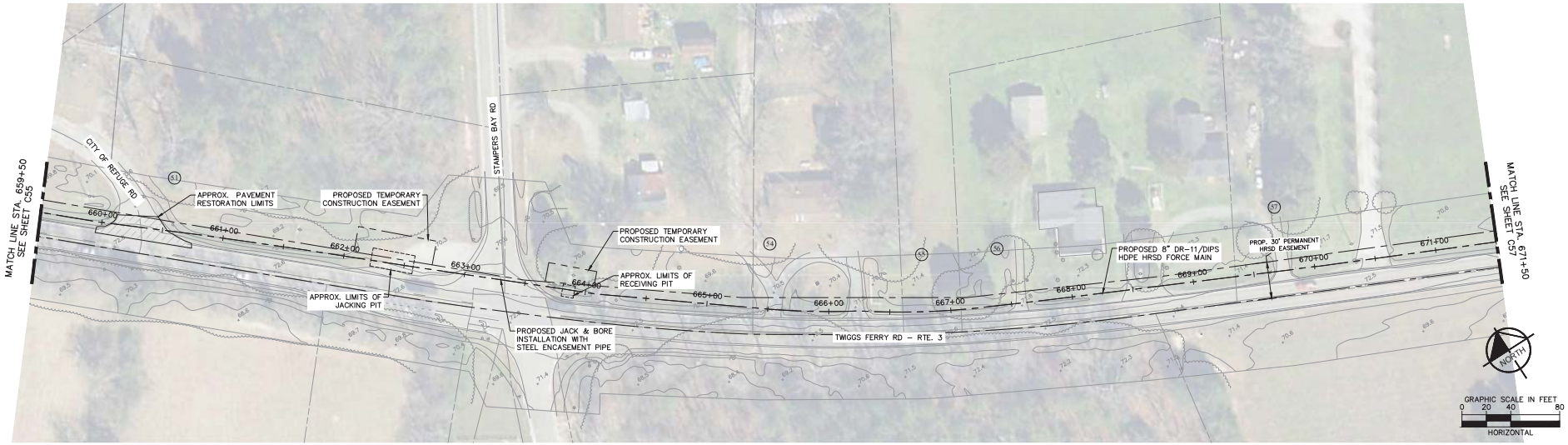
NO.	DATE	BY	REVISION

FM Plan and Profile (648+00 - 659+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C55
SCALE:	1" = 40'	SHEET NO.:	58 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

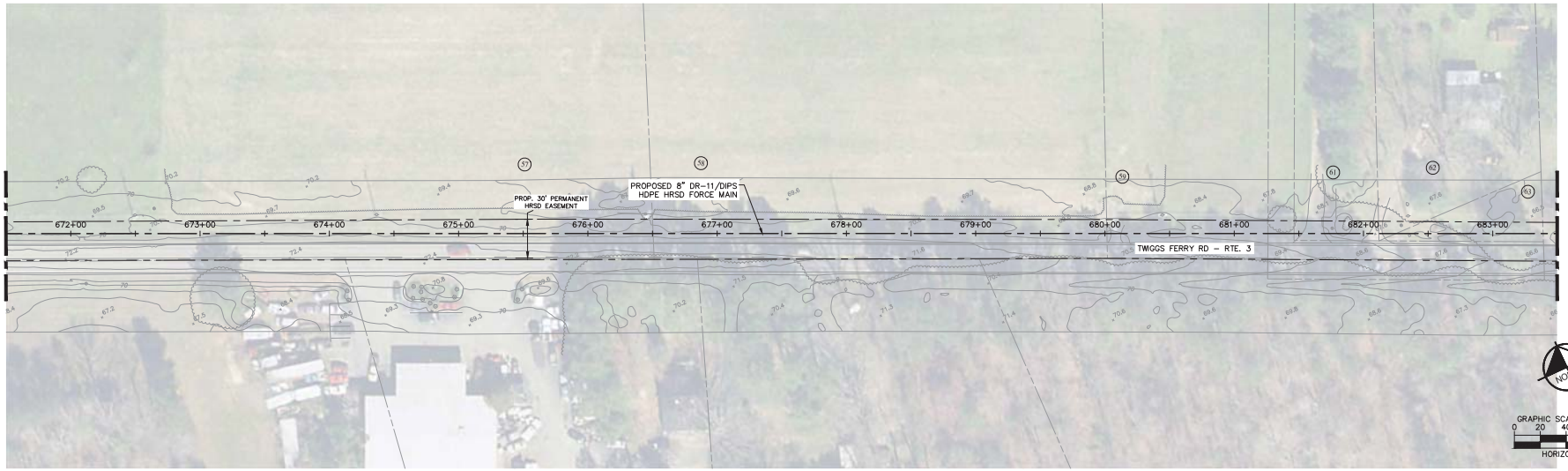
NO.	DATE	BY	REVISION

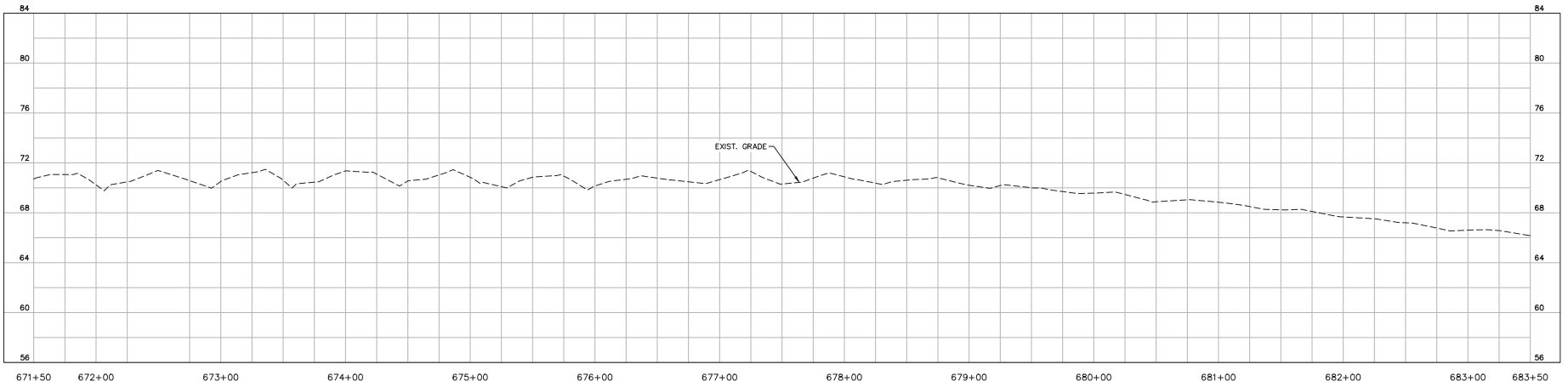
FM Plan and Profile (659+50 - 671+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C56
SCALE:	1" = 40'	SHEET NO.:	59 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

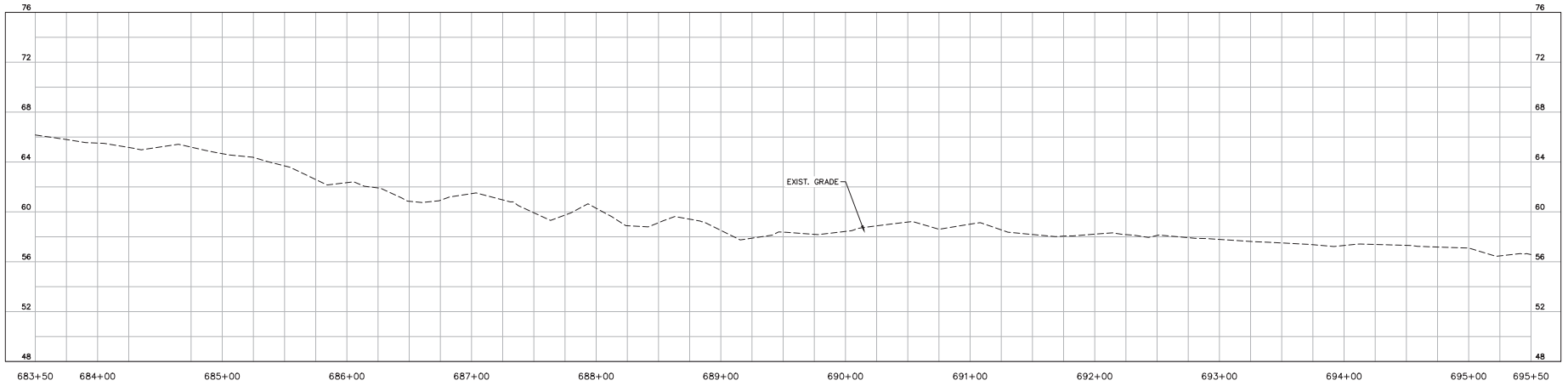
NO.	DATE	BY	REVISION

FM Plan and Profile (671+50 - 683+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C57
SCALE:	1" = 40'	SHEET NO.:	60 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

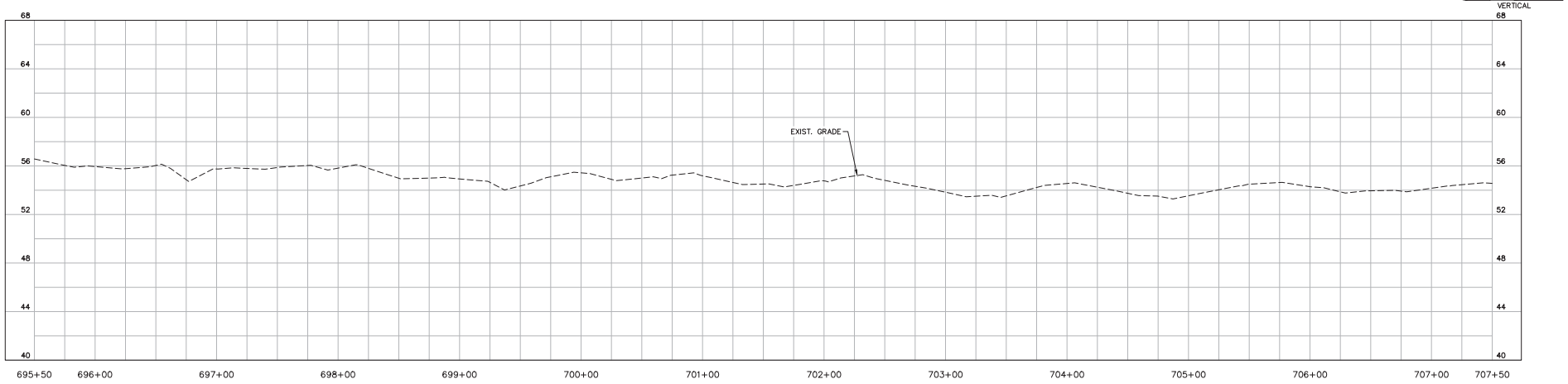
NO.	DATE	BY	REVISION

FM Plan and Profile (683+50 - 695+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C58
SCALE:	1" = 40'	SHEET NO.:	61 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

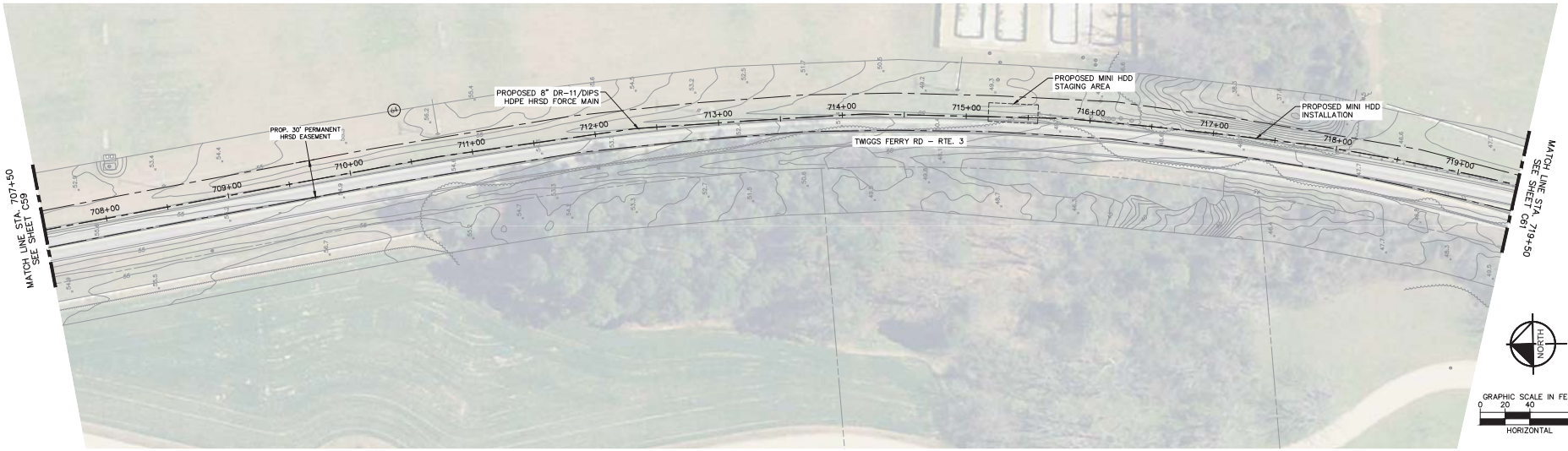
NO.	DATE	BY	REVISION

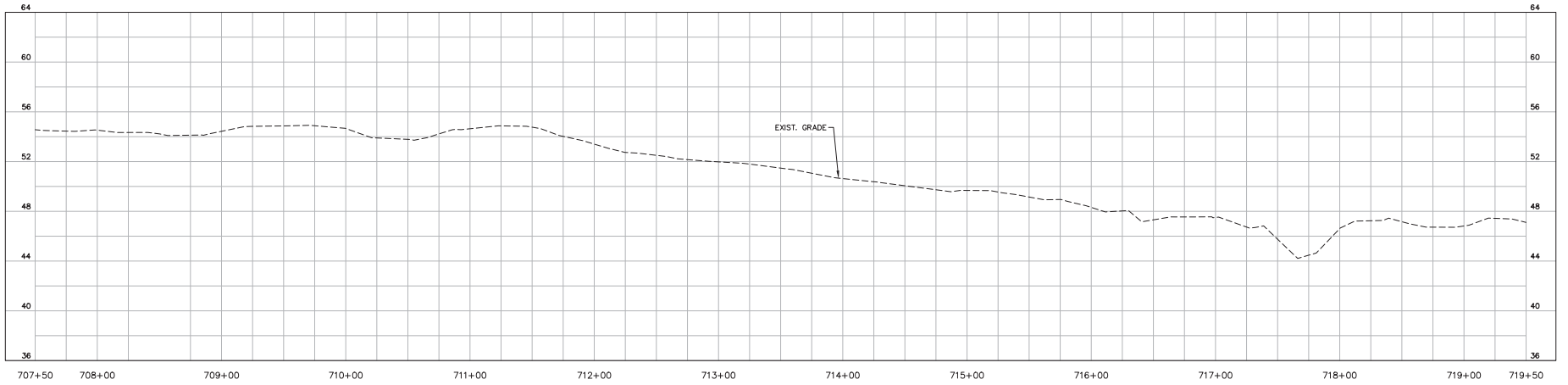
FM Plan and Profile (695+50 - 707+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C59
SCALE:	1" = 40'	SHEET NO.:	62 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

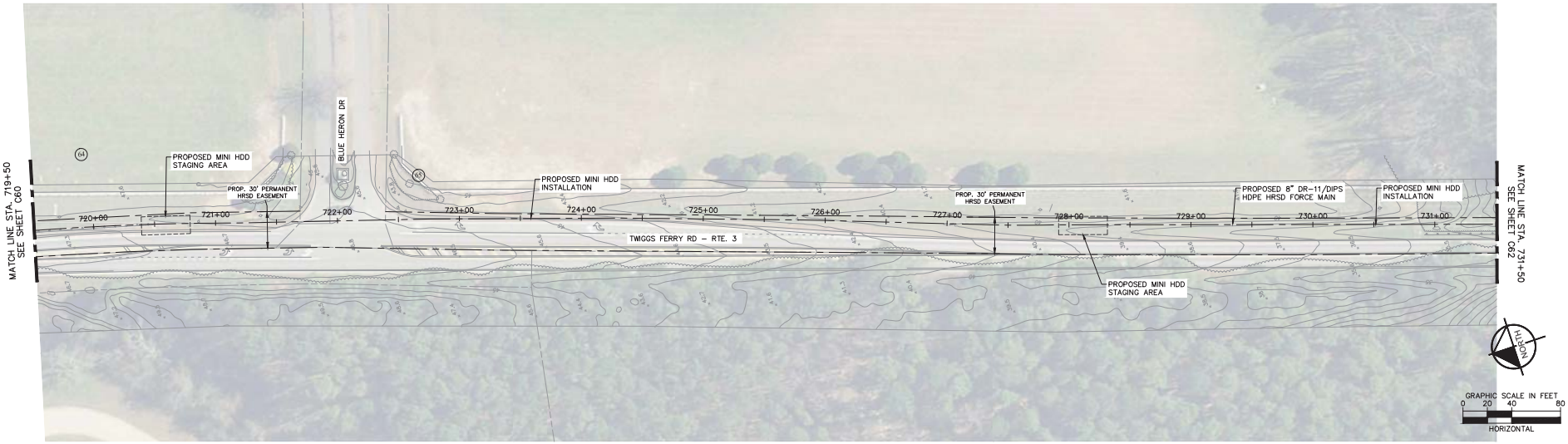
NO.	DATE	BY	REVISION

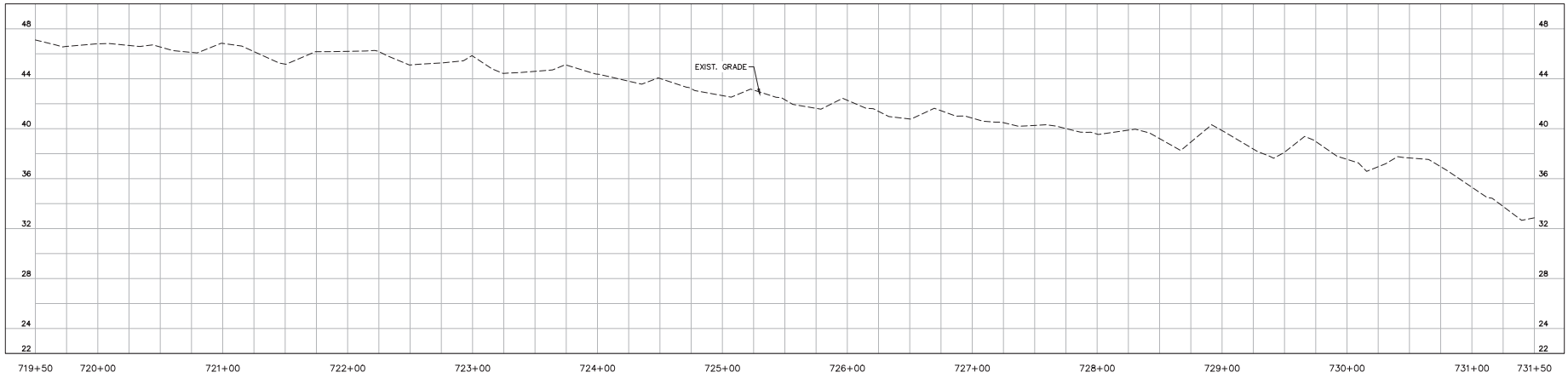
FM Plan and Profile (707+50 - 719+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C60
SCALE:	1" = 40'	SHEET NO.:	63 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

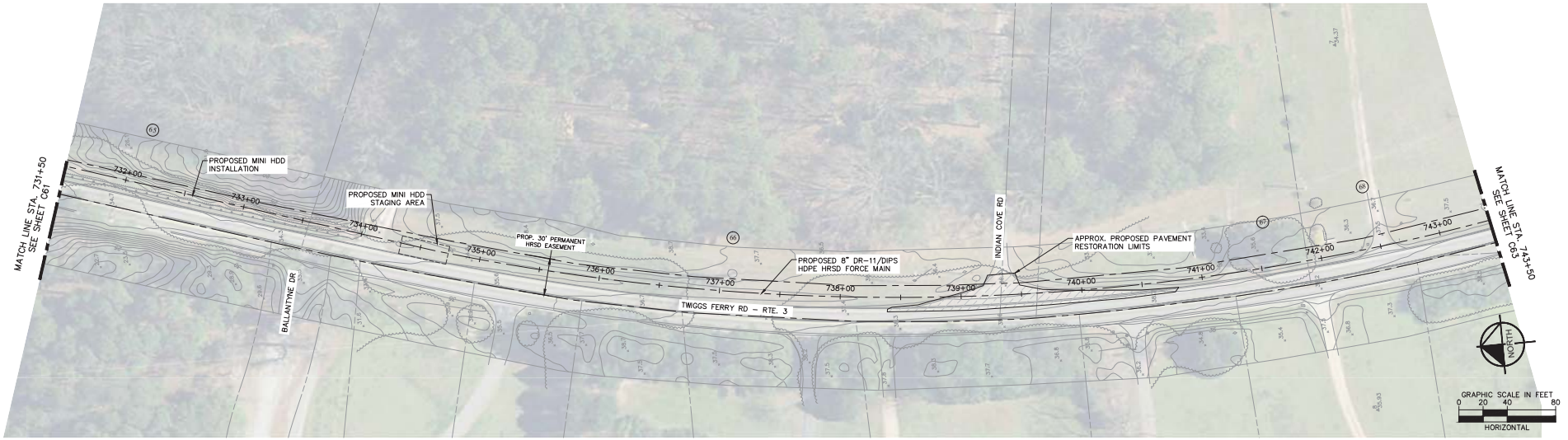
NO.	DATE	BY	REVISION

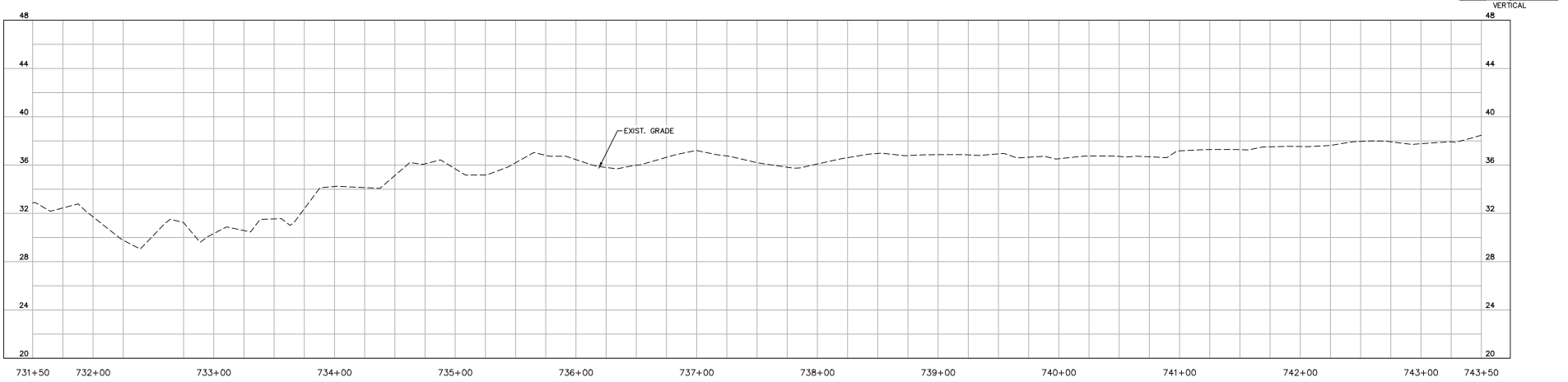
FM Plan and Profile (719+50 - 731+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C61
SCALE:	1" = 40'	SHEET NO.:	64 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

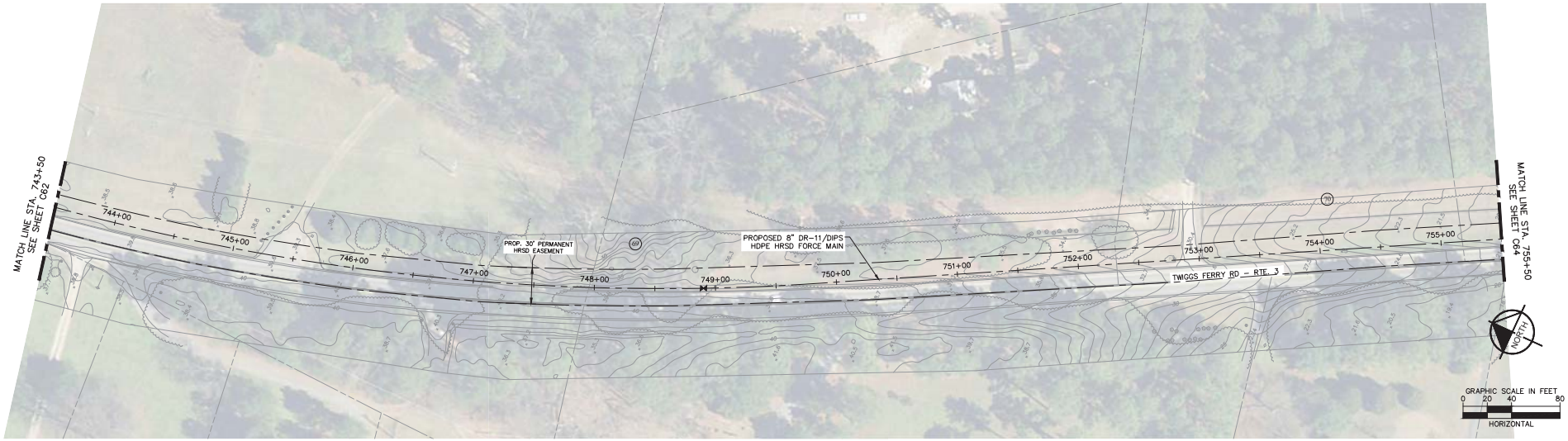
NO.	DATE	BY	REVISION

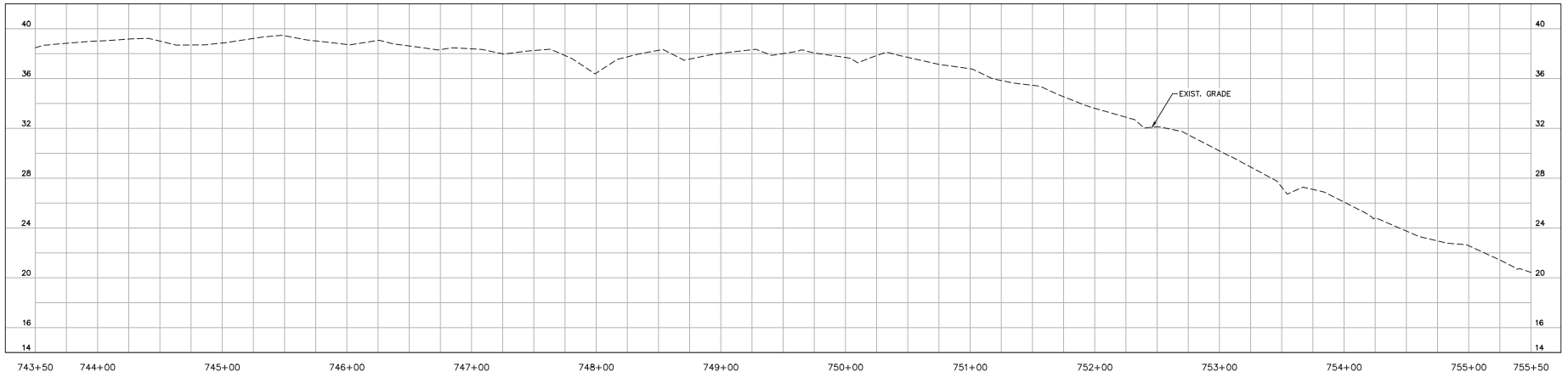
FM Plan and Profile (731+50 - 743+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C62
SCALE:	1" = 40'	SHEET NO.:	65 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

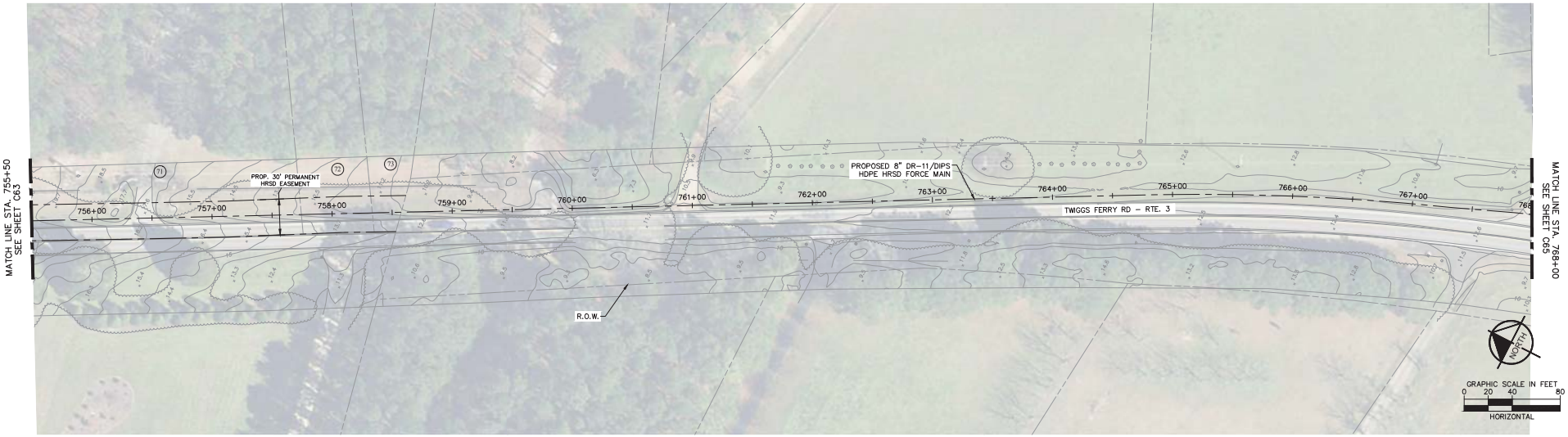
NO.	DATE	BY	REVISION

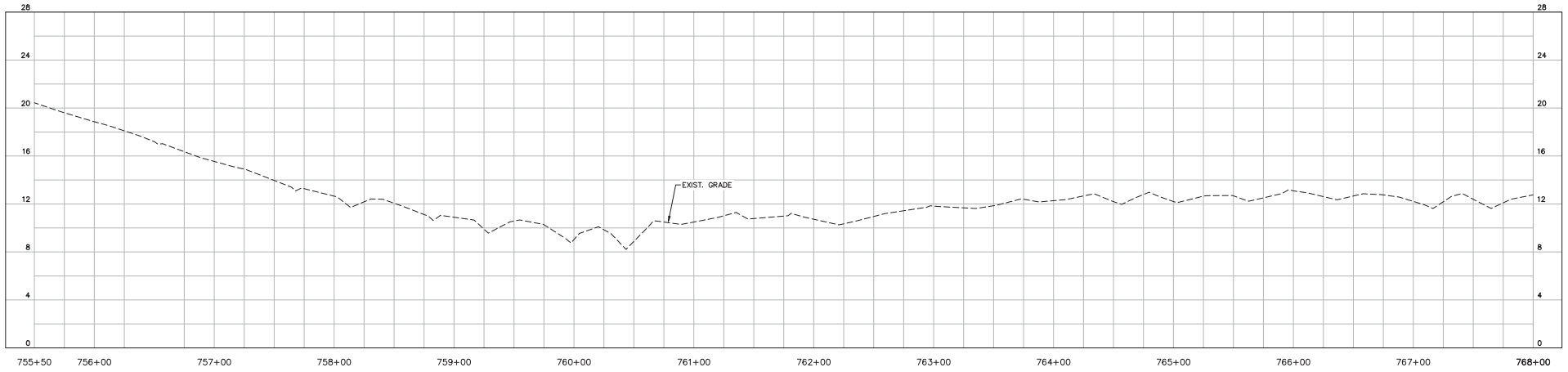
FM Plan and Profile (743+50 - 755+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C63
SCALE:	1" = 40'	SHEET NO.:	66 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

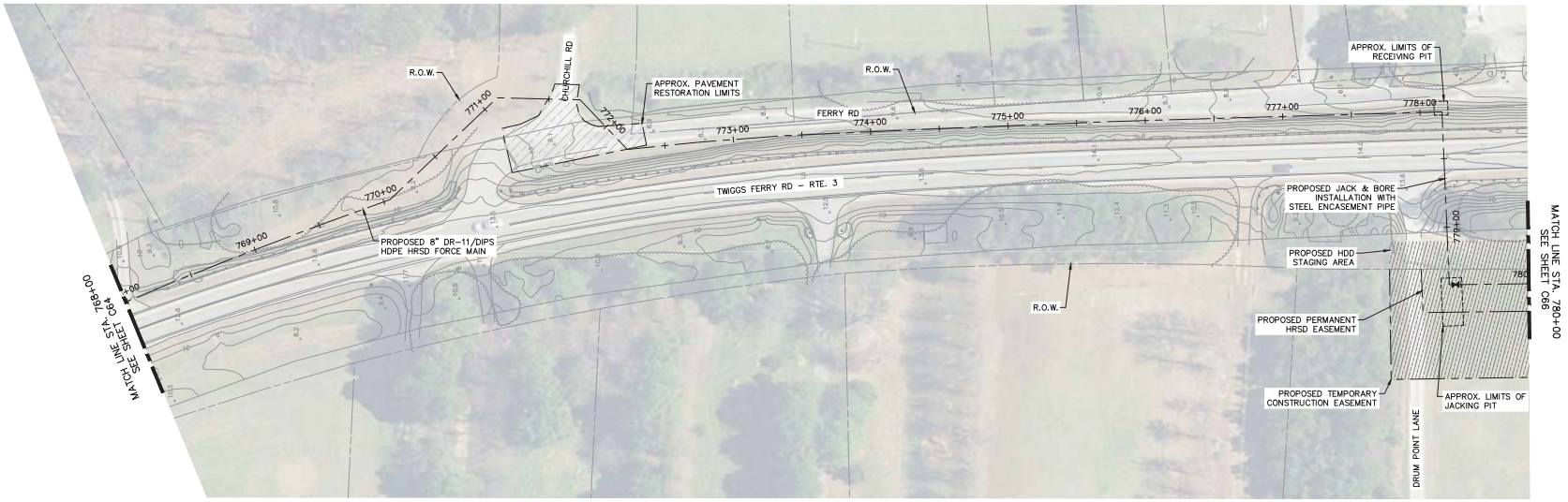
NO.	DATE	BY	REVISION

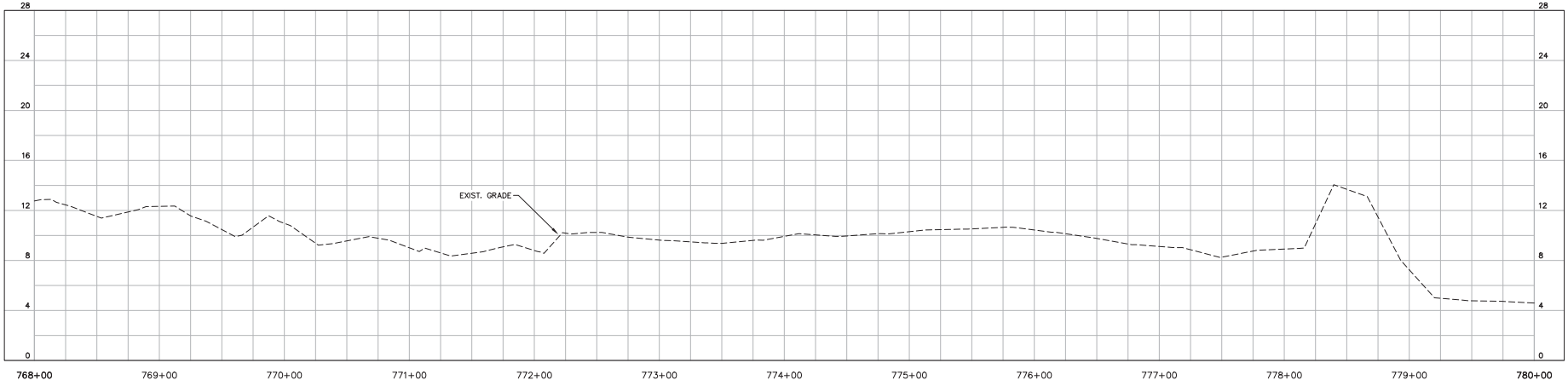
FM Plan and Profile (755+50 - 768+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C64
SCALE:	1" = 40'	SHEET NO.:	67 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

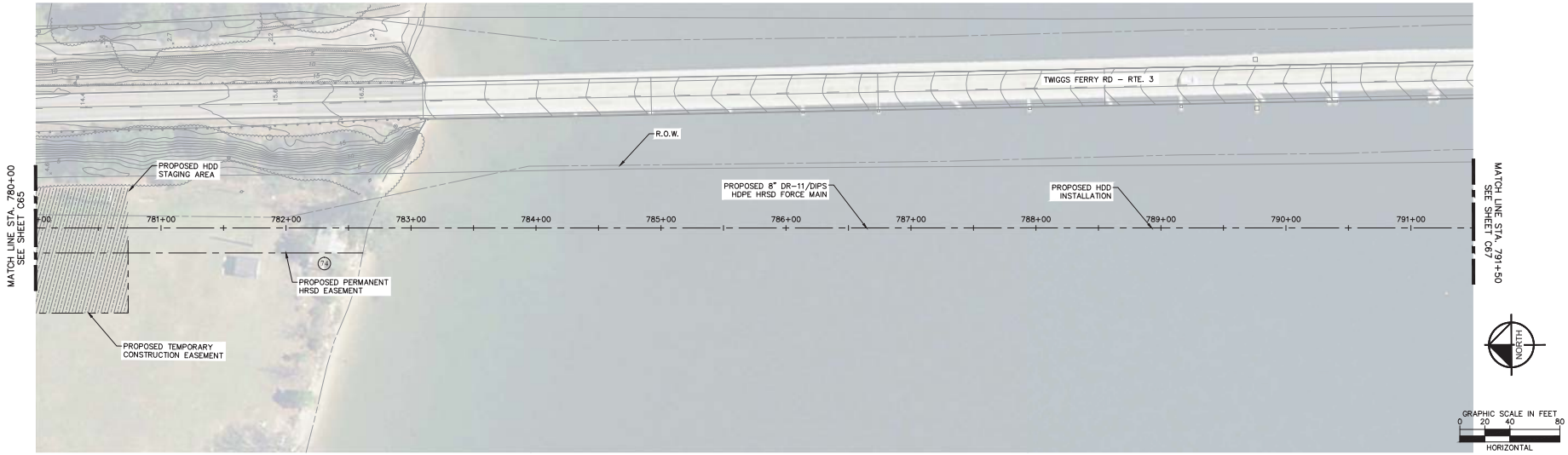
NO.	DATE	BY	REVISION

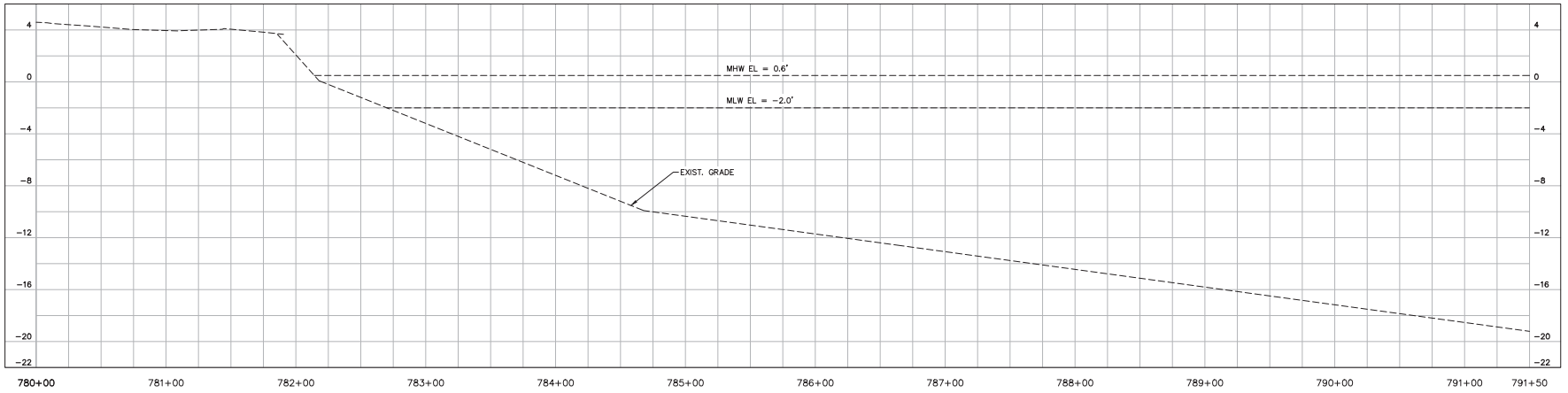
FM Plan and Profile (768+00 - 780+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C65
SCALE:	1" = 40'	SHEET NO.:	68 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

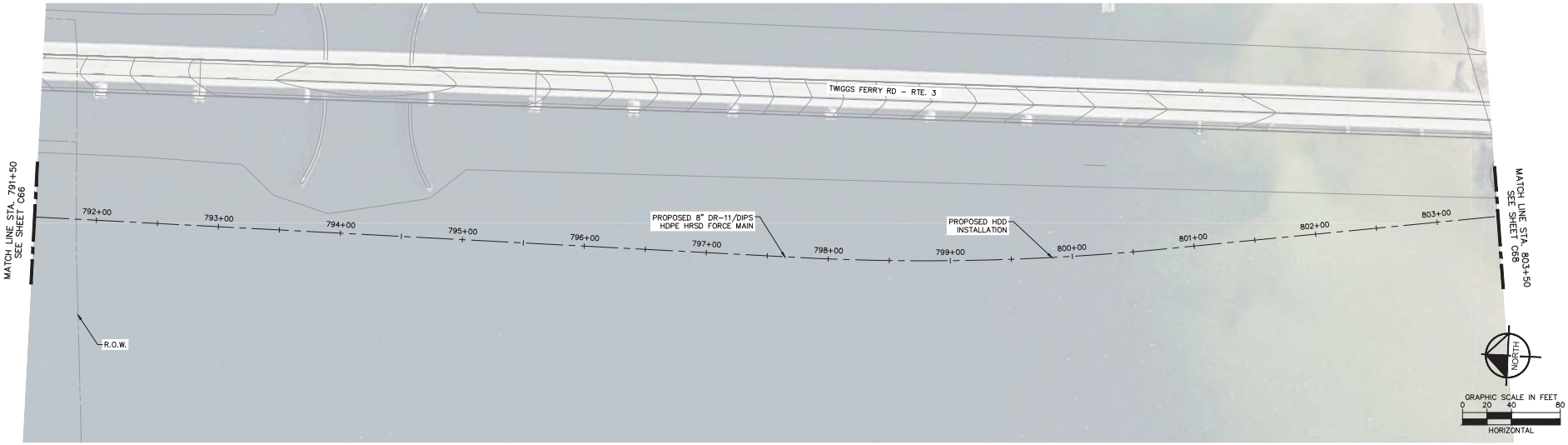
NO.	DATE	BY	REVISION

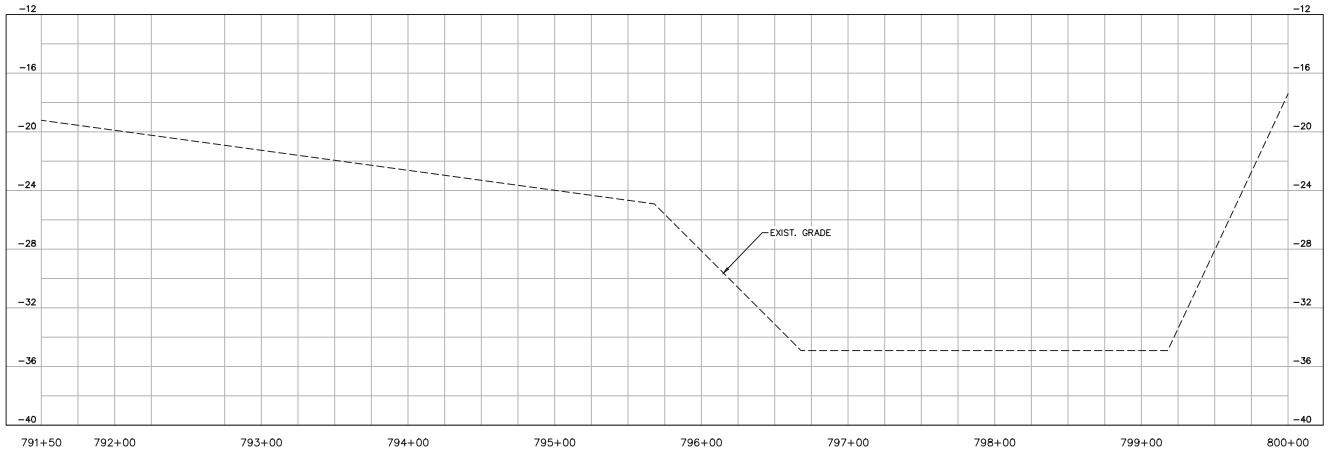
FM Plan and Profile (780+00 - 791+50)

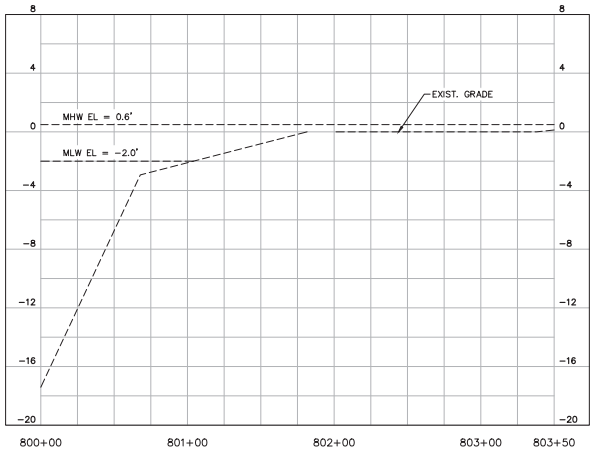
HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C66
SCALE:	1" = 40'	SHEET NO.:	69 of 77







30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

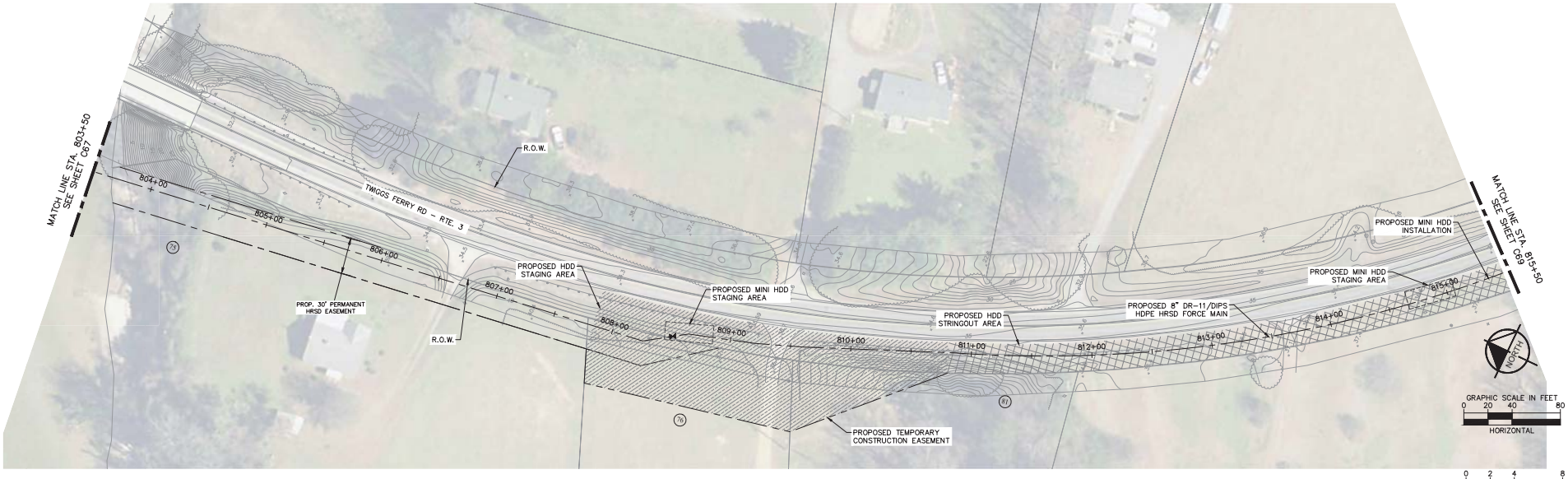
NO.	DATE	BY	REVISION

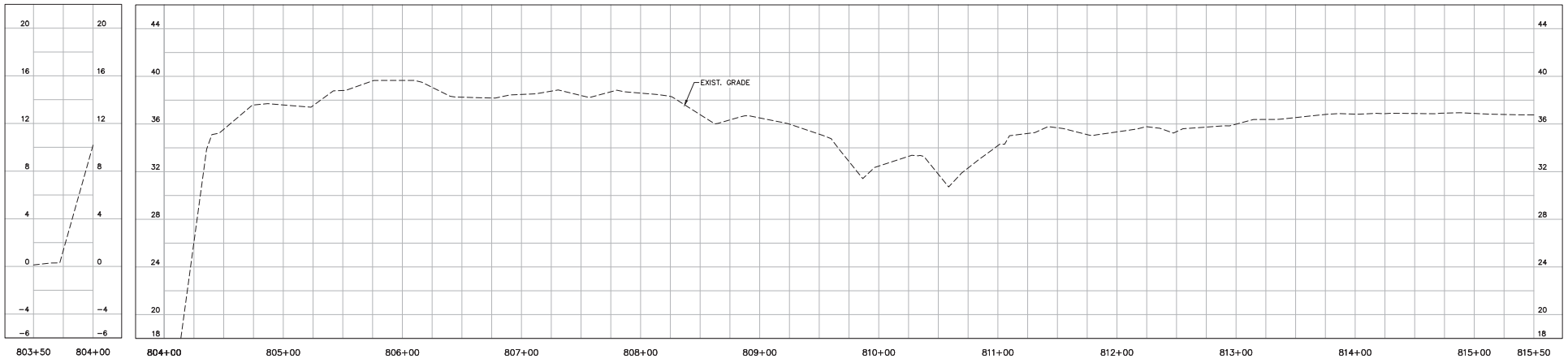
FM Plan and Profile (791+50 - 803+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C67
SCALE:	1" = 40'	SHEET NO.:	70 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

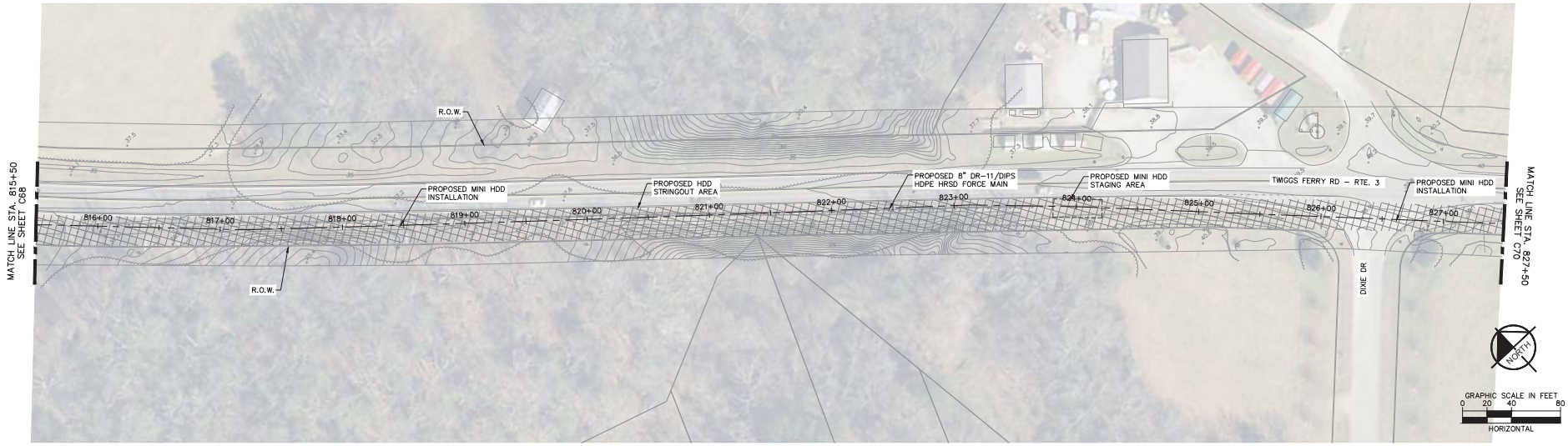
NO.	DATE	BY	REVISION

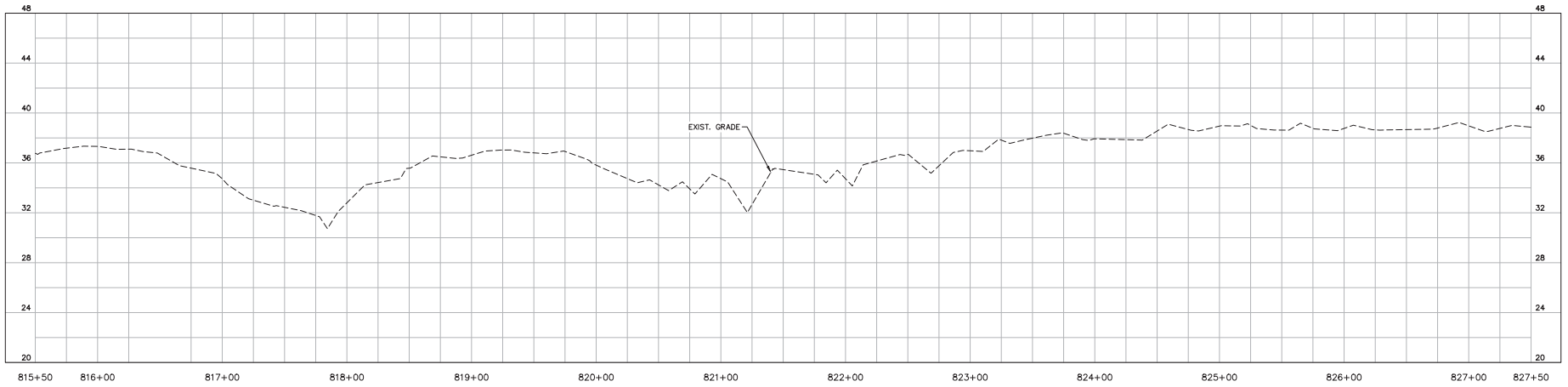
FM Plan and Profile (803+50 - 815+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C68
SCALE:	1" = 40'	SHEET NO.:	71 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

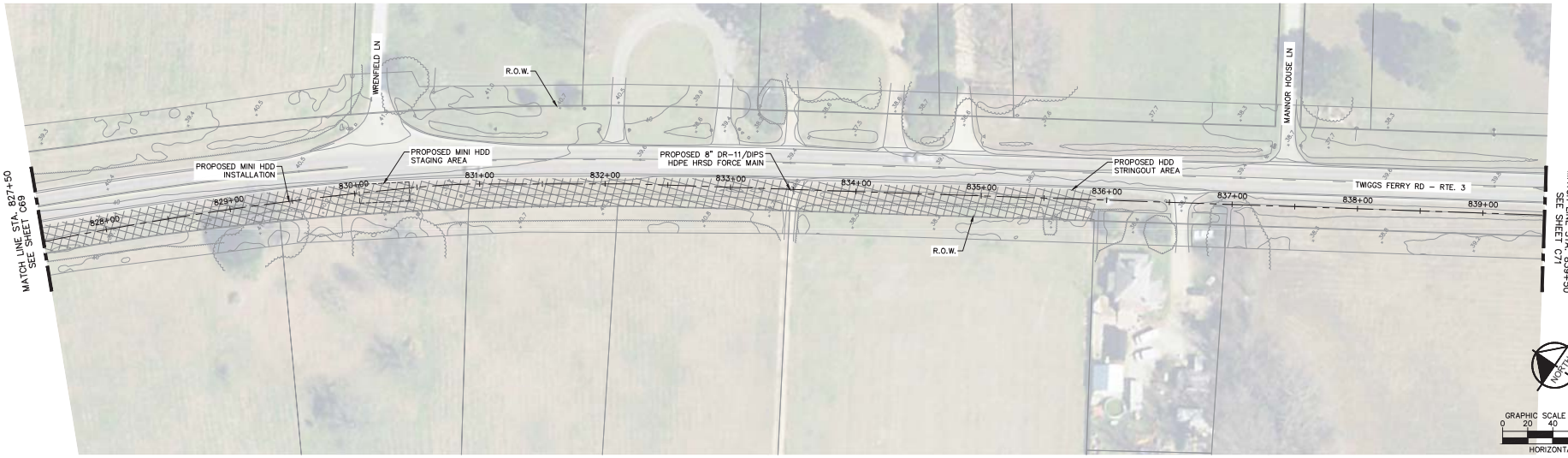
NO.	DATE	BY	REVISION

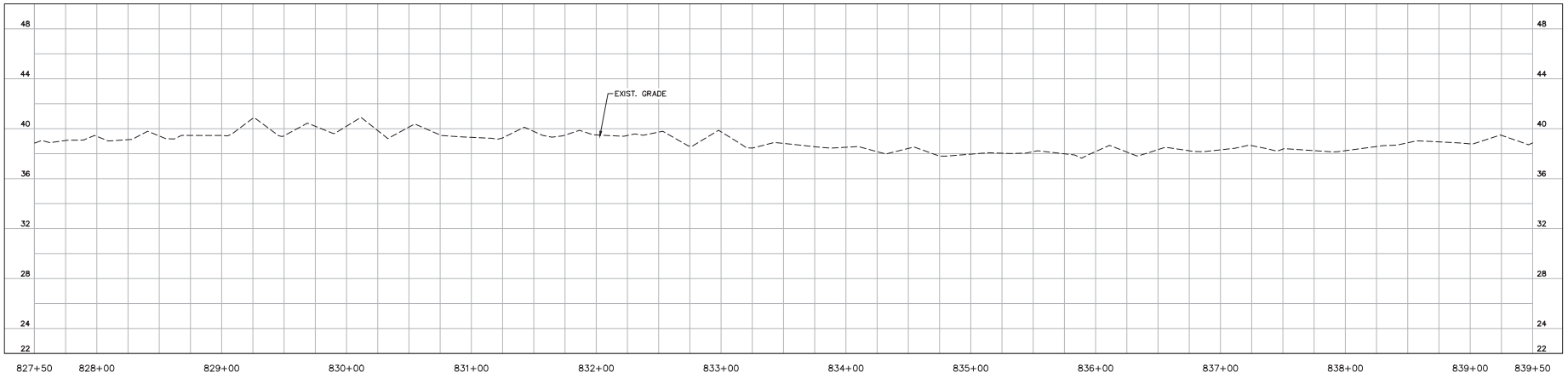
FM Plan and Profile (815+50 - 827+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C69
SCALE:	1" = 40'	SHEET NO.:	72 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

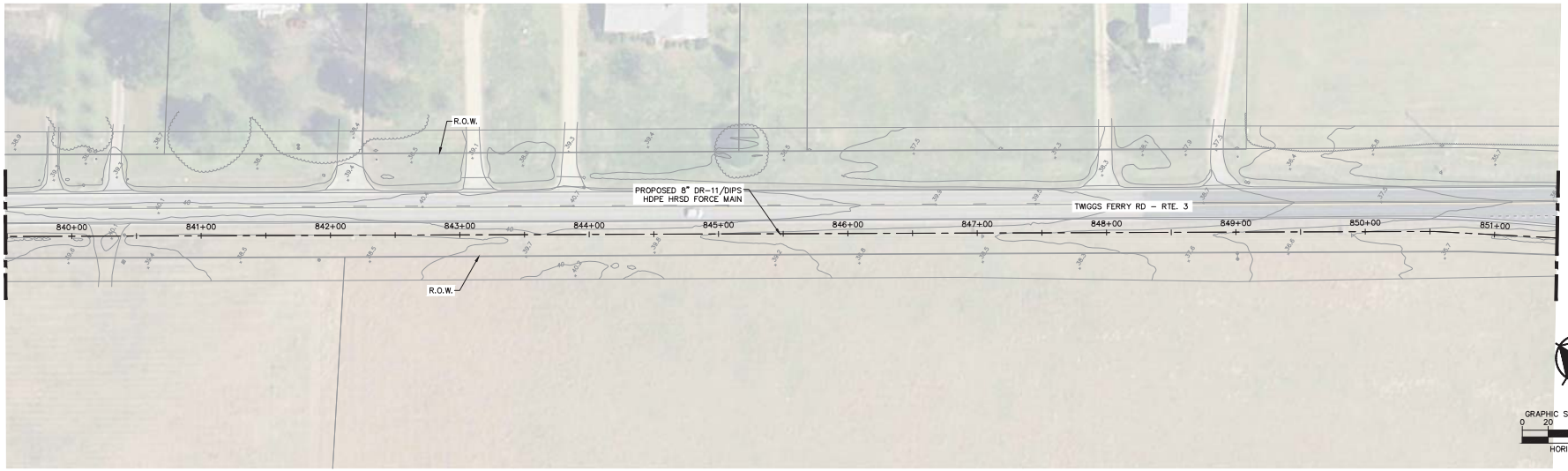
NO.	DATE	BY	REVISION

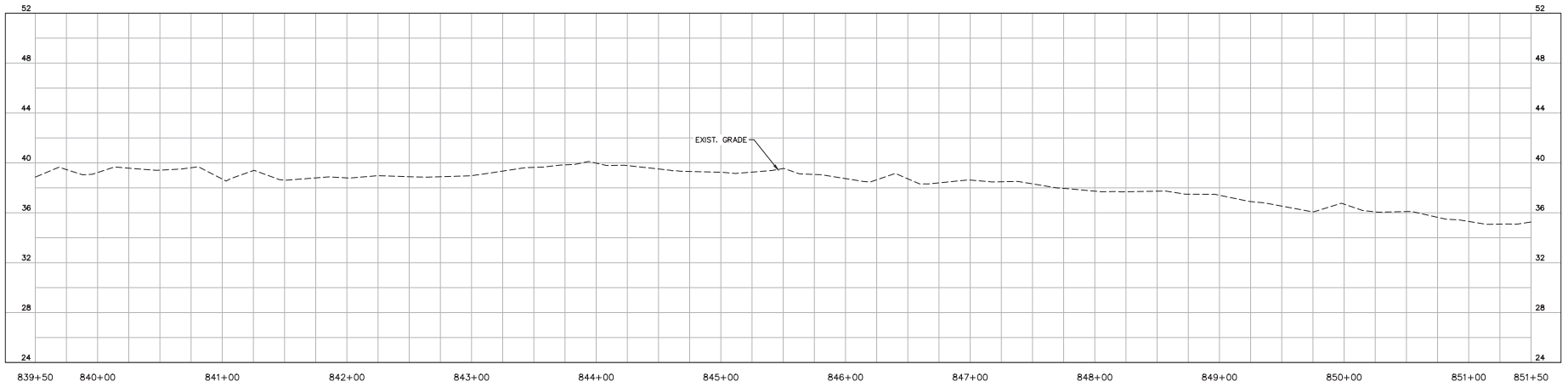
FM Plan and Profile (827+50 - 839+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C70
SCALE:	1" = 40'	SHEET NO.:	73 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

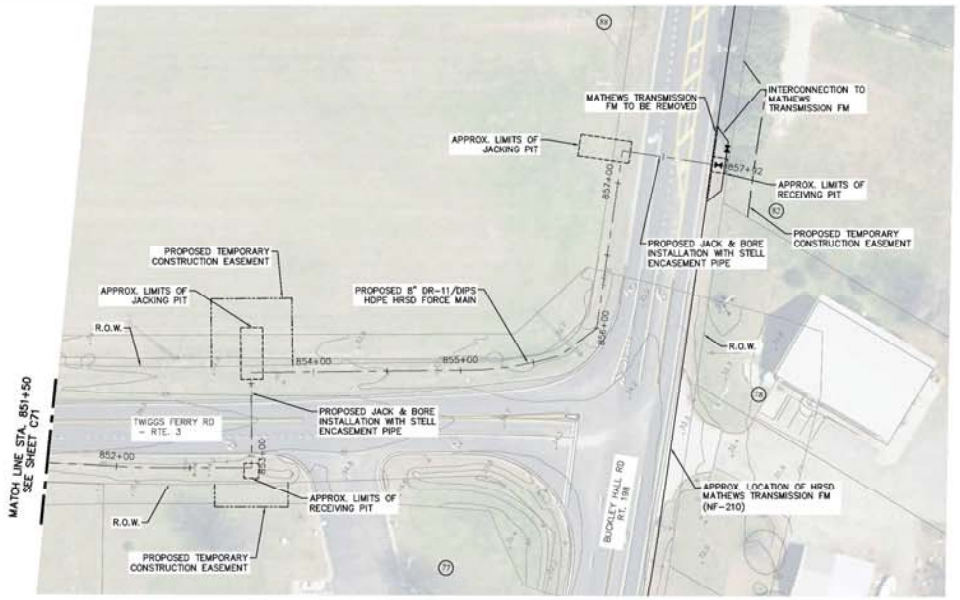
NO.	DATE	BY	REVISION

FM Plan and Profile (839+50 - 851+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C71
SCALE:	1" = 40'	SHEET NO.:	74 of 77



851+50 852+00 853+00 854+00 855+00 856+00 857+00 857+92.19

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

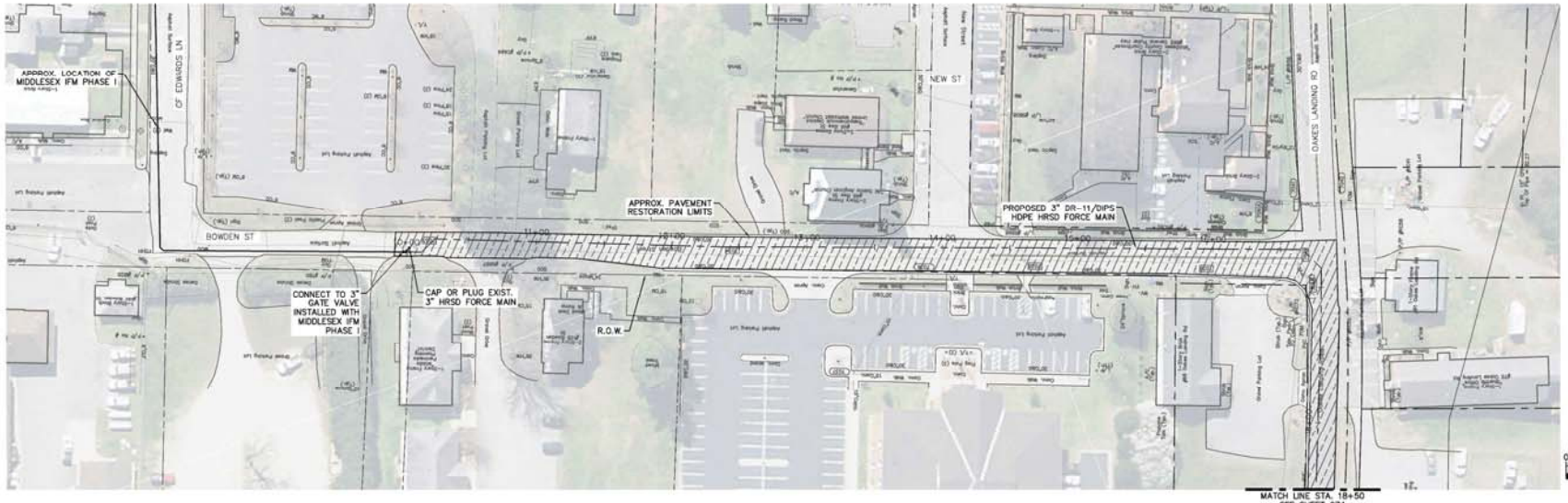
NO.	DATE	BY	REVISION

FM Plan and Profile (851+50 - 857+92)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Intereceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C72
SCALE:	1" = 40'	SHEET NO.:	75 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

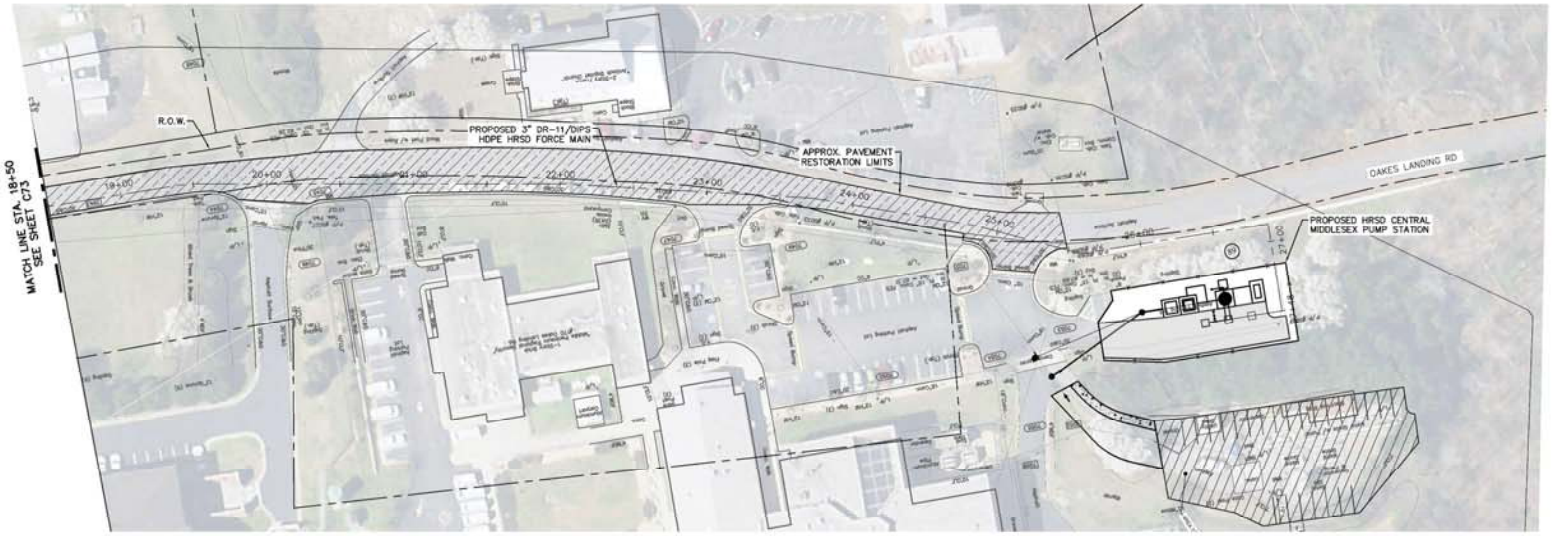
NO.	DATE	BY	REVISION

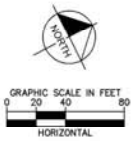
Middlesex IFM Phase I
Extension
Plan and Profile (10+00 - 18+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C73
SCALE:	1" = 40'	SHEET NO.:	76 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

Middlesex IFM Phase I
Extension
Plan and Profile (18+50 - 26+76)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C74
SCALE:	1" = 40'	SHEET NO.:	77 of 77

Appendix D: Middlesex Interceptor Subaqueous HDD Feasibility Study

BRIERLEY ASSOCIATES
Creating Space Underground

July 8, 2020
File Number: 120158-000

Kimley-Horn
4525 Main Street, Suite 1000
Virginia Beach, VA 23462

Attention: Scott Funk, PE
Project Manager

RE: Middlesex Interceptor Subaqueous HDD Feasibility Study
Middlesex County, Virginia

This report provides feasibility comments for the subaqueous horizontal directional drill (HDD) portions of a proposed forcemain pipe project in Middlesex County, Virginia. The pipe is planned to extend from Urbanna in Middlesex County to northwestern Mathews County, Virginia. Components include a 3.2-mile force main from Urbanna to Cook's Corner along Route 33 and a 13-mile force main from Cook's Corner to the existing Mathew's Transmission Force Main (TFM). The pipe will convey wastewater to the York River Treatment Plant (YRTP).

Two (2) trenchless crossings have been proposed along the FM corridor. These include Urbanna Creek near the town of Urbanna in proximity to the existing Route 227 bridge, and the Piankatank River to the west side of the existing Highway 3 bridge. Horizontal directional drilling (HDD) has been proposed to install the forcemain pipe at both crossings to reduce surface disturbance during installation. The 30% HDD design is under development by Kimley-Horn.

Our work was performed in general accordance with our Proposal No. 120158-970 dated June 8, 2020 and executed on June 16, 2020.

PROJECT BACKGROUND

The following documents have been provided by Kimley-Horn to Brierley for our use in completing our review:

1) "UrbannaCreek_HDD," 3 sheets in PDF presenting the 30% design Plan and Profile for the Urbanna Creek crossing prepared by Kimley-Horn for this study.
2) "PiankatankRiver_HDD," 3 sheets in PDF presenting the 30% design Plan and Profile for the Piankatank River crossing prepared by Kimley-Horn for this study.
3) "Proposed Bridge over Urbanna Creek at Urbanna," 15 sheets in TIF format prepared by the Commonwealth of Virginia Department of Highways providing bid documents for the original bridge for Highway Route 227 (1956) and for repairs to bridge (1980).
4) "Proposed Bridge over Piankatank River," 15 sheets if TIF format prepared by the Commonwealth of Virginia Department of Highways providing bid documents for the original bridge for Highway 3 (1951).

5) "Report_permit," 3 sheets in PDF including photographs and permit information from the Virginia Marine Resources Commission (VMRC) for a 2100' subaqueous fiber optic cable installation across the Piankatank River on the west side of the existing Highway 3 bridge.
6) "JPA-Piankatank Fiber Install," 29-page permit application to the VMRC for the subaqueous fiber optic crossing including details of proposed installation techniques.
7) CAD drawings in DWG format including:
    a. Hdd2.dwg
    b. Middlesex_Water_System_Survey_8492-02-002-TP.dwg, and
    c. Xborder-116320052.dwg.

According to documents provided by Kimley-Horn, the water main for the HDD section will consist of either an 8" FPVC (DIPS/DR18) or 10" HDPE (DIPS/DR7) pipe. The Urbanna Creek crossing as shown on the plans provided by Kimley-Horn is approximately 2,019 linear feet (plan distance), trending northwest-southeast. The Piankatank River crossing is approximately 2,901 linear feet (plan length), trending roughly north to-south. Table 1 and Table 2 present details of the currently proposed HDD alignments included on the Kimley-Horn Plan and Profile sheets.

Table 1: Summary of Urbanna Creek HDD Details Included on 30% Kimley-Horn Drawings

Description	Station (ft)	Approximate Elevation (ft)	Detail
HDD Entry	10+00	+5	-12 degree entry angle
Start Vertical Curve	11+09	-19	1000 ft radius
End Vertical Curve	13+17	-40	
Start Horizontal Curve	14+25	-40	1200-ft radius
End Horizontal Curve	22+68	-40	
Start Vertical Curve	26+01	-40	1000-ft radius
End Vertical Curve	28+43	-10	
HDD End	30+19	+32	14 degree exit angle

Table 2: Summary of Piankatank River HDD Details Included on 30% Kimley-Horn Drawings

Description	Station (ft)	Approximate Elevation (ft)	Detail
HDD Entry	0+00	+4	-12 degree entry angle
Start Vertical Curve	3+66	-72	1000 ft radius
End Vertical Curve	5+74	-95	
Start Horizontal Curve	18+62	-95	2000-ft radius
End Horizontal Curve	21+08	-95	
Start Vertical Curve	22+97	-95	1000-ft radius
End Vertical Curve	25+72	-56	
HDD End	29+01	+39	16 degree exit angle

SURFACE CONDITIONS

The project site is situated primarily within Middlesex County, with a short portion south of the Piankatank River in Mathews County. The area is within a rural setting, with relatively flat terrain dominated by farmland with surrounding forest (Figure 1).

Urbanna Creek Crossing

Urbanna Creek is tidally influenced, and part of a short fluvial system that drains into the Rappahannock River just east of the town of Urbanna. According to documents provided by Kimley-Horn for the construction of the Highway 227 bridge (circa 1956), the mean high tide for Urbanna Creek is approximately Elevation +2.0 feet while the mean low tide is approximately -0.9 feet for a total tidal range of 2.9 feet.

The HDD entry area for the Urbanna Creek crossing is about 1,500 feet south of the Urbanna town center, just east of Nimcock Road within a narrow easement of approximately 40 feet to 50 feet in width situated between several country homes with large parcels. Trending initially east-southeast, the HDD passes beneath the creek bank after about 100 feet and continues beneath Urbanna Creek for about 1,100 feet before passing beneath the wooded eastern creek bank and beneath open farmland to the exit area about 800 feet inland from the creek. According to the Plan and Profile drawings provided by Kimley-Horn, the elevation ranges from about +5 feet at the entry area (west side) to about +35 at the exit area (east side). The assumed depth of Urbanna Creek along the alignment is a maximum of about 10 feet based on the Plan and Profiles prepared by Kimley-Horn.

Piankatank River Crossing

The Piankatank River is also tidally influenced. According to obtained from the Virginia Department of Transportation (VDOT) for the repair work of Highway 3 (dated 2011), the mean high tide for the Piankatank River is approximately +0.6 feet and the mean low tide is approximately -2.0 feet, for a total tidal range of 2.6 feet. It is noted on the 2011 drawings that VDOT applied a correction factor to the tidal values presented in 2011 as compared to the original records from the 1951 construction of the bridge (the 1951 values presented were mean high tide +1.7 feet and mean low tide -0.9 feet, so the correction factor is calculated as -1.1 feet). Extreme tidal ranges do occur during certain tidal cycles of year or during severe storm events which can add several additional feet to the values above.

The entry area for the Piankatank River crossing is within open farmland about 300 feet north of the river bank and about 80 feet west of the southbound Highway 3 lane. Trending southward, the HDD continues beneath the river for about 2,100 feet before passing beneath the wooded river bank and beneath open farmland to the exit area about 500 feet inland from the river. According to the Plan and Profile drawings provided by Kimley-Horn, the elevation ranges from about +3 feet at the HDD entry (north side) to about +39 at the HDD exit (south side). The assumed maximum depth of the Piankatank River along the alignment is a maximum of about 35 feet based on the Plan and Profiles prepared by Kimley-Horn.

SUBSURFACE CONDITIONS

a. Existing Utilities

Urbanna River Crossing

Based on readily available information, no existing buried utilities are anticipated within the easement for the Urbanna Creek HDD crossing (based on the project Plan and Profile view drawings as provided by Kimley-Horn).

Piankatank River Crossing

Along the Piankatank River HDD crossing, an existing Metrocast fiber optic cable has been installed within a 25-ft easement in close proximity to the planned HRSD pipe alignment (Figure 2 - based on a drawing prepared by Rofton Industries dated November 2, 2011). Kimley-Horn provided documents showing the installation of this cable in late 2011 via marine trenching. The cable is shown as having been trenched into the sediments to a depth of 3 feet below the mudline. For the shoreline landings the cable was installed by horizontal directional drilling. The as-built HDD details for the cable were not available at the time of this report.

A Dominion Energy easement of 25 ft width borders to the west of the Metrocast fiber optic cable easement, and documents provided by Kimley-Horn show that a 35-kV cable and a Verizon fiber optic cable were installed within that easement (Figure 2). Pictures from the cable installation show an overhead Dominion power line strung along poles at 600-ft spacings across the river, driven into the shallow marine sediments ranging from about 20 to 40 feet west of the bridge; these poles have been subsequently removed and the power line has been relocated to within the easement west of the fiber optic cable. Details of the relocation of the electric cable, and its as-built location, were not available at the time of this report. It is not known if the vertical poles were entirely removed by pulling, or if they were cut off at the mudline and the subsurface portions of these poles remain intact.

b. Regional Geology

The project site (Figure 3) is located within the Virginia Coastal Plain physiographic province, which is a portion of the Coastal Plain Geomorphic Province that continues in a wide swath from New Jersey to Florida. The materials that comprise the Coastal Plain sediments range in age from Late Cretaceous (about 70 million years ago) to modern times and deposition of new sediments onto the coastal plain is ongoing. In general, the geologic age of the surficial materials becomes younger across the Coastal Plain province from west to east.

The Virginia Coastal Plain province extends eastward from the Fall Line near Richmond to the Virginia coastline and continues offshore across the Continental Shelf. The Coastal Plain consists of a wedge of unconsolidated to poorly consolidated sediments eroded from the Piedmont province to the west. The stratigraphy is composed of alternating layers of uncemented sand, silt and clay with occasional gravel lag deposits, resulting from river, deltaic and marine deposition. The individual strata show high degrees of lateral and vertical variability.

The Geologic Map (*Mixon, et.al., 1989, Geologic map and generalized cross sections of the Coastal Plain and adjacent parts of the Piedmont, Virginia, USGS Miscellaneous Investigations Series Map I-2033, scale 1:250,000*) of the area surrounding the Middlesex Interceptor project (Figure 3) suggests that that the surficial materials consist of unconsolidated soil units ranging in age from the Upper Pliocene-Lower Miocene boundary (roughly 5 million years ago) to Upper Pleistocene (as young as about 10,000 years ago). However, in the vicinity of the two HDD crossings, we infer that the majority of the shallow sediments onshore near the entry and exit points are from the Quaternary Tabb Formation; Sedgefield Member for the Urbanna Creek crossing and from the Quaternary Shirley Formation and the Pliocene-Miocene Yorktown Formation for the Piankatank River crossing. Each of these geologic formations consist predominantly of relatively loose to medium dense granular materials with localized, typically non -continuous cohesive layers which dip gently eastward to southeastward.

It is important to note that all the low elevational water course tributaries (those of elevations at or near modern day sea level) that drain into the Chesapeake Bay are actually drowned valleys. These drowned valleys were deeply cut during times of lower sea level about 17,000 years ago and have become infilled during the Holocene Epoch with thick unconsolidated sediment sequences as global sea levels rose. Therefore, it is likely that portions of the shallow subaqueous sediments that will be penetrated by the HDD bores are geologically recent alluvial materials that are younger and relatively looser/weaker than the surrounding soil units on either bank.

c. Site Stratigraphy

At the time of issuance of this Feasibility Report, no project-specific geotechnical data had been acquired in the vicinity of the HDD crossings. We have developed a preliminary discussion of the site stratigraphy for each crossing based on readily available information. These stratigraphic relationships are also shown on the Plan and Profile sheets (Appendix A) which have been modified from the Plan and Profile set provided by Kimley Horn (30% Submittal Not for Construction, dated June 2020). These stratigraphic relationships as shown should be considered conceptual only until additional project specific geotechnical information can be acquired. Recommendations for site-specific investigations are included at the end of this report.

Urbanna Creek Crossing

For the Urbanna Creek crossing, no geotechnical data was readily available from the nearby Highway 227 Bridge. The nearest data available to use as reference are a series of geotechnical borings performed for the Highway 3 (circa 1950) crossing of the Rappahannock River, about 8 miles east of the Urbanna Creek crossing and about 7.5 miles north of the Piankatank River crossing (Figure 3). The data is presented as a series of stick logs with only the material descriptions and sampler hammer blow counts (which are assumed to be equivalent to Standard Penetration Test N-blow count values) presented. Despite the distance between the sites, the geologic map (Figure 3) shows the that surficial and shallow subsurface geologic units encountered at the Rappahannock River crossing are likely to be roughly comparable in material type and in-situ conditions to these anticipated at the HDD crossings. Due to the large distance between the sites and lack of laboratory testing data, only general comments on the stratigraphy at Urbanna Creek are described below.

At this time, we anticipate that that the onshore portions of the Urbanna Creek crossing including the entry and exit areas, are underlain by the Tabb Formation, consisting of loose to medium dense silty sands (SM) to medium sands (SP) with occasional sandy clay (CL) layers. Fine gravel to 1" diameter and wood fragments, including tree stumps may be present. Note that surficial fill soils may present, associated with previous site grading activities.

Below the Urbanna Creek mudline, we anticipate geologically recent (Holocene) sediment consisting of very loose to loose, non-plastic silts (ML) and silty fine sand (SM) to low plasticity very soft to soft silts and clayey silts (ML). The thickness of these materials may range from about 20 to 30 feet (estimated). Clean medium quartz sand layers, peat and other organic deposits, and rounded pea gravel typically no more than 0.5" diameter are infrequent inclusions. These geologically recent materials deposited during the formation of the Chesapeake Bay as sea levels rose to their current levels are anticipated to infill the creek channel to a depth of several tens of feet including to the proposed depth of the HDD crossing.

Since no project specific test borings have been performed, an accurate representation of the groundwater levels away from the subaqueous portions of the crossings were not determined. However, we infer that the groundwater would rise away from the banks at a rate of about 0.5 to 1 foot per 100 feet.

Piankatank River Crossing

Limited geotechnical information was made available by VDOT for the adjacent Highway 3 Bridge that were completed for a fender replacement project in 2011. For that study, four (4) deep geotechnical borings were completed in the central portion of the bridge to depths ranging from 95.5 to 100.5 feet below the river bottom. These borings were used as the basis for our pull force and annular pressure analyses presented in Appendix B.

For the Piankatank River HDD crossing, we anticipate that the onshore portions of the crossing including the entry and exit areas are underlain by sediment of the Quaternary Shirley Formation, including loose to medium dense silty sands (SM) to medium sands (SP) with occasional cohesive layers (CL, SC). Note that surficial fill soils may present, associated with previous site grading activities.

The overwater borings completed by VDOT in 2011 for the Highway 3 bridge repairs did not include any laboratory testing, but the boring log descriptions and Standard Penetration Test blow count information suggest that the Piankatank River is underlain by about 20 feet of geologically recent (Holocene) sediment ("river mud") consisting of very soft to soft silt (ML-MH) and high plasticity clay (CH) overlying about 19 feet of very loose to loose silty fine sand (SM) with wood fragments and trace fine gravel we infer to be part of the Shirley Formation. At about Elevation -60 feet, the borings encountered the top of the older Yorktown Formation, composed of medium dense to dense silty fine sand (SM) with firm to stiff clay (CL-CM) layers, trace fine gravel and marine shell fragments to the maximum depths explored, about Elevation -120 feet.

d. Estimated Geotechnical Parameters for Preliminary HDD Assessment

Since no project specific geotechnical studies have been performed for the study, we have estimated geotechnical parameters based on our experience with similar studies within the Virginia Coastal Plain. These parameters are based in part upon information provided by the Virginia Department of Transportation (VDOT) for transportation projects within the Virginia Coastal Plain region.

Table 3 presents suggested preliminary geotechnical properties based on VDOT guidelines for the Coastal Plain. The properties listed are for the soils the HDD installations may encounter; in the case of the Piankatank River we infer that geologically recent undifferentiated Holocene sediments are present overlying the Yorktown Formation in the subaqueous portions of the HDD crossing. Note that these parameters should be revisited following site-specific subsurface investigations and laboratory testing. Note that that we have not included fill soils, as these are anticipated to be relatively thin (<5 feet).

Table 3: Suggested geotechnical properties of native soils (Urbanna Creek crossing)

Design Parameter	Tabb Formation (onshore portions)	Undifferentiated Holocene Soils (overwater portion)
Unit Weight (pcf), dry/moist	108	Not Applicable
Unit Weight (pcf), saturated	115	107
Friction angle (phi deg)	30	28
Fines Content	15-40	20-60
Atterberg Limits	Non-plastic (NP)	50-60 LL / 15-25 PL
Cohesion (psf)	0	50
Groundwater Levels	Elevation +1 to +7, rising away from river at about 1% slope	Elevation +0

Table 4: Suggested geotechnical properties of native soils (Piankatank River crossing)

Design Parameter	Tabb Formation and Shirley Formation (onshore and intermediate overwater portions)	Undifferentiated Holocene Soils (shallow overwater portion)	Yorktown Formation (deeper overwater portion)
Unit Weight (pcf), dry/moist	108	Not Applicable	Not Applicable
Unit Weight (pcf), saturated	115	107	122
Friction angle (phi deg)	28	28	32
Fines Content	15-40	20-60	20-75
Atterberg Limits	Non-plastic (NP)	50-60 LL / 15-25 PL	30-50 LL / 15-20 PL (clay layers)
Cohesion (psf)	0	50	0
Groundwater Levels	Elevation +1 to +7, rising away from river at about 1% slope	Elevation +0	Elevation +0

HDD DESIGN REVIEW COMMENTS

a. General

As noted, our comments for the two crossings are based on the Kimley-Horn Drawings (30% Submittal Not for Construction, dated June 2020), as presented in Appendix A. Based on the provided site information, and the established installation criteria, an installation by HDD method **IS CONSIDERED TECHNICALLY FEASIBLE** for each of the proposed crossings. The following sections provide recommendations intended to reduce project risk, and to improve overall constructability.

b. Horizontal Directional Drilling (HDD) Geometry

We offer the following recommendations relative to the geometry shown on the Kimley-Horn Drawings:

- The vertical and horizontal curve radii are presently shown as 1,000-ft each for the vertical curves and 1,200 to 2,000 ft for the horizontal curves. We recommend a minimum radius of 1,800 feet given the potential for soft soils
- Kimley Horn has set up the deflections to not overlap such that no compound curves occur. It is important to have at **least 150 feet** between vertical and horizontal tangents in the pipe to help with steering of the pilot hole. Due to presence of relatively weak/soft soils, the driller potentially will not have sufficient lateral and vertical capacity to provide reaction to accurately steer the pilot hole through the drill path curves planned along the HDD alignments.
- To reduce the height of the pipe lift during pullback, it may be advantageous to reduce the HDD exit angles to 12 degrees above horizontal.
- For the Piankatank River crossing, we recommend modifying the exit tangent such that the pipe can be pulled from the laydown area (along the west side of Twiggs Ferry Road – Highway 3) into the borehole with minimal above-grade curvature. This will require rotating the exit tangent slightly counterclockwise (from that as presently shown in the Plan and Profile drawings).

c. Existing Utilities

As noted, the proposed Piankatank HDD installation is in close lateral proximity to an existing shallow trenched fiber optic cable line as well as a Dominion 35 KV power cable and a Verizon cable (Figure 2). In the case of the fiber optic cable, installation plans as shown in Figure 2 show that the onshore sections were installed via HDD techniques and in these areas the cables could be at the same elevations of the proposed force main pipe for a portion of the alignment.

In order to reduce the risk of utility strikes during construction we recommend the following:

- Verify the as built location of all parallel or crossing utilities within 100-ft of the HDD installation via SUE (Subsurface Utility Engineering)-type soft-dig or equivalent methods, and add these locations to the project Drawings, for the Contractor's reference.
- Maintain at least 20-ft vertical offset clearance below the existing shallow buried utilities beneath the Piankatank River.

- Maintain at least 15 ft horizontal offset between the proposed pipe alignment and the existing utility alignments.
- If existing utilities are within 15-ft of the HDD installation, they should be exposed prior to and during construction, to ensure they are not damaged during drilling, reaming or product pipe pullback.
- Notify the owners of the subject utilities of the proposed HDD installation in advance of construction. Additional offset or site controls may be required depending on the condition and sensitivity of the existing utility and associated safety concerns.

d. Annular Pressure Analysis

During HDD construction, a bentonite-based fluid is pumped down the center of the drill rods and returns in the annulus between the drill rods and the excavated hole. The drilling fluid provides support to the excavated hole, removes cuttings, cools and lubricates the drill tools, and assists in the excavation process. The drill fluid (with cuttings) travels up the annulus of the bore (outside of drill rods), and is collected at ground surface, at either the entry or exit pit. The drill fluid is cleaned with a solids separation system, then the drill fluid is recycled back into the hole. Typically, drill fluid is used during all phases of HDD construction, including pilot hole drilling, reaming, conditioning, and product pullback. Alternative materials may be used to address site specific issues but typically at a much higher cost.

The drill fluid returns exert a hydrostatic and hydrodynamic annular pressure on the adjacent geologic materials. The hydrostatic pressure is a function of the density of the drill fluid at a specific location and the depth below the drill entry. Hydrodynamic pressure is required to move the drill fluid (and cuttings) up the hole annulus, and is a function of hole geometry, fluid density, fluid velocity, and fluid rheology.

When drill fluid is lost from the borehole and appears at the ground surface, it's commonly termed an inadvertent drill fluid return (IR, or "fracout"). An annular pressure analyses for predicting hydraulic fracturing during the pilot hole drilling for the proposed geometry for each HDD crossing as shown on the Kimley-Horn drawings has been completed. The analysis involves comparison of the anticipated downhole annular pressures required to complete the pilot bore to the estimated confining capabilities of the surrounding geologic materials. The following should be noted:

- The annular pressure analysis performed for this feasibility level study is based on a very generalized understanding of the subsurface geology and stratigraphy, particularly at the Urbanna Creek crossing where no existing geotechnical boreholes were available to allow site-specific characterization of the subsurface conditions.
- The annular pressure analysis is considered a tool to identify areas of potential risk for hydraulic fracturing, but they may also be an indicator of hydraulic jacking failure potential. Results are not considered an exact predictor of the location or degree of an IR.
- The annular pressure analysis is not an accurate predictor of borehole leakage.
- There may be areas of additional risk of IR related to past site disturbance, such as pile and utility pole driving and removal, and utility installation.

The drill fluid confinement capability of the surrounding geologic materials was estimated using the cavity expansion method (Delft equation). For the purpose of the preliminary analysis, we have assumed that the subsurface conditions are consistent and uniform at each crossing although that rarely occurs over long linear distances in Coastal Plain sediments. In the case of the Urbanna Creek crossing, we have assumed the entire crossing is within relatively loose, geologically recent alluvial materials. In the case of the Piankatank Creek Crossing, we have assumed that the crossing passes through denser, geologically older Yorktown Formation sediments based on available geotechnical information from the adjacent Highway 3 bridge.

The range of the estimated downhole annular pressures for the preliminary pilot hole geometry is shown in Appendix B. The estimated downhole annular pressure as shown to account for reasonable variation in drill fluid properties. Also shown for comparison is the estimated confining capability of the surrounding geologic materials. It should be noted that where the estimated annular pressure (green) exceeds the confining capability of the surrounding material (red), the potential for an IR may exist. The results presented in Appendix B suggests that the risk of IR is present below both Urbanna Creek and the Piankatank River. If possible, we recommend that Kimley-Horn consider deepening the bores to increase confining capacity, and reduce the risk of IR. This may require moving the HDD exit point further from the water bodies. It may also be prudent to establish a maximum allowable annular pressure during drilling, and require annular pressure monitoring during pilot hole advance. Depending on permit requirements, the contractor(s) performing the work should also be required to develop a site-specific drill fluid containment and contingency release plan for review. This plan would detail how the contractor would detect a drill fluid release (if it were to occur), stop the release from continuing, clean up the drill fluid, and modify procedures such that drilling could continue.

e. **Product Pipe**

The pipe planned for the HDD section consists of either an 8” FPVC (DIPS/DR18) or 10” HDPE (DIPS/DR7) pipe. As per discussions with Kimley-Horn, we have run the analyses as follows:

- Urbanna Creek Crossing - 10” HDPE (DIPS/DR7)
- Piankatank River Crossing - 8” FPVC (DIPS/DR18)

We summarize the following pipe materials to be utilized at each crossing:

Urbanna Creek Crossing - 10” HDPE (DIPS/DR7)

- Material: HDPE PE4710
- Dimensions: 10-in DIPS DR7
- Outside Diameter: 11.100 in
- Minimum Wall: 1.586 in
- Average Inside Diameter: 7.738 in
- Weight per foot: 20.70 pounds per linear foot
- Pressure Rating: 333 psi @ 73 deg F
- Safe Pull Force: 54,507 lbs.

Piankatank River Crossing - 8" FPVC (DIPS/DR18)

- Material: Fusible PVC – C-900®
- Dimensions: 8-in DIPS DR18
- Outside Diameter: 9.05 in
- Minimum Wall: 0.50 in
- Average Inside Diameter: 7.98 in
- Weight per foot: 8.75 pounds per linear foot
- Pressure Rating: 235 psi @ 73 deg F
- Published Safe Pull Force 37,800 lbs. (per Underground Solutions, FPVC supplier)

At the Urbanna Creek HDD crossing, the allowable tensile load of the 10-in HDPE DIPS/DR7 is estimated to be 54,507 lbs. at 73 deg F. Pipe installed at this location by HDD will be pulled into the prepared borehole and subjected to short-term tensile loading. For planning purposes, the anticipated short-term pull force for the 10-in HDPE DIPS/DR7 associated with the geometry shown on the Kimley-Horn Drawing is 16,900 lbs. This assumes that the pipe is filled with water during pullback. The resulting factor of safety against failure during pull back is therefore approximately 3.2. Additional details of the pull force analysis are included in Appendix B

At the Piankatank HDD crossing, the allowable tensile load of the 8-in FPVC DIPS/DR18 is estimated to be 37,800 lbs. at 73 deg F. Pipe installed at this location by HDD will be pulled into the prepared borehole and subjected to short-term tensile loading. For planning purposes, the anticipated short-term pull force for the 8-in FPVC DIPS/DR18 associated with the geometry shown on the Kimley-Horn Drawing is 17,979 lbs. This assumes that the pipe is filled with water during pullback. The resulting factor of safety against failure during pull back is therefore approximately 2.1. Additional details of the pull force analysis are included in Appendix B.

It should be noted that the actual pull forces measured for the two HDD crossings will vary depending the following factors:

- Hole Diameter (for an 8" FPVC pipe we anticipate a 12-in diameter borehole, for a 10-in HDPE pipe we anticipate an 18-in borehole);
- Hole geometry (including the presence of small-scale bends, or "dog-legs");
- Hole stability;
- Friction factors, based on geologic materials encountered;
- Drill fluid density within the hole annulus;
- Drill fluid shear;
- Above-ground pipe handling methods;
- Above-ground pipe geometry; and
- Degree of pipe ballasting. It is noted that both estimates above assumed the pipe would be filled with fresh water during installation. Leaving the pipes empty, or only partially full, has a significant impact on the pull force and Factors of Safety provided above, and is not recommended.

The pull force analysis in Appendix B should be revisited if the HDD geometry on the Kimley-Horn drawing is modified.

Pipe installed by HDD will be subjected to short term external hydrostatic loads associated with the adjacent drill fluid, and long-term external loading associated with depth of burial and external soil and groundwater conditions. Pipe which does not resist external loads may buckle and collapse. We recommend that a short and long-term buckling analysis be completed for the pipe once test borings have been completed and the design drill depth has been finalized. Depending on the installed depth, the pipe may need to remain full of water to resist collapse.

f. Workspace Requirements during HDD activities

Considering the length and depth of the proposed HDD, along with the surface and subsurface conditions as described in previous section of this report, we anticipate the following workspace requirements during HDD activities.

- For the entry point, an area of about 100 ft x 150 ft will be required at each site for the drill rig, mud pit and ancillary equipment. The currently proposed HDD entry at Urbanna Creek is in close proximity to several residential structures. Noise barriers may be required at this location, depending on local ordinances.

- For the exit point, an area of about 120 ft x 60 ft will be required at both sites for the ancillary equipment including mud pit, and equipment required to manage the pipe during pullback.

- For the pipe laydown, about 2,000 feet of right of way will be required at Urbanna Creek to lay down the pipe prior to pullback. At the Piankatank River the pipe laydown will require about 3,100 feet. The laydown area should be about 25 feet wide (minimum). Conflicts with driveways (driveway crossings) can be accommodated with temporary shallow pits covered by steel plates. If possible, the product pipe should be fully assembled and tested prior to commencing pullback. The contractor will require this space throughout construction to assemble and test the pipe.

The anticipated minimum work space requirements are shown on the Plan and Profile sheets, in Appendix A. It should be noted that these may vary by contractor. While smaller work areas may be feasible, they may restrict operations, and/or result in increased costs.

ADDITIONAL INFORMATION

The following is recommended prior to completion of final HDD design:

- Locations and depths of adjacent shallow utilities need to be confirmed and added to the project drawings.
- VDOT bridge easement limits should be determined and added to the plans.
- It should be determined if any private water supply wells are present within 100 feet of the proposed installations. If present, we recommend completing a pre-construction pump test to establish a baseline flow rate to protect HRSD.

- The Dominion, Metrocast and Verizon utilities (Piankatank River) should be added to the design drawings, and reasonable offsets from the proposed HRSD installation established. The offset distances will depend on the accuracy of the as-builts. It should be noted that the presence of these utilities may result in interference during pilot hole steering.
- The demolition records of the dominion line should be consulted prior to finalizing the HRSD pipe HDD design.
- Test borings should be completed near the entry and exit locations of the proposed HDD alignment and at several locations along the crossing. The borings should be offset from the proposed alignment by about 25 feet. These test borings should include:
    - Urbanna Creek (total 5 borings): Entry and exit area borings to 50 feet below ground surface, an additional land boring on the southeast side of the creek at approximate Station 24+00 to a depth of at least 100 feet below ground surface, and two borings drilled from a barge within the creek at approximate Stations 14+00 and 19+00 to depths of at least 75 feet below mudline.
    - Piankatank River (total 7 borings): Entry and exit area to 50 feet below ground surface, and additional land boring on the south side of the river at approximate Station 25+00 to a depth of at least 140 feet below ground surface, and four borings drilled from a barge within the creek at approximate Stations 5+00, 10+00, 15+00, 20+00 to depths of at least 100 feet below mudline.
    - It is noted that should the HDD path geometry be modified for either crossing to that shown on the Plan and Profile Sheets (Appendix A), in all cases the borings should extend at least 25 feet below the revised pipe invert elevation.
- The test borings should be sampled at intervals no greater than 5-ft. Water levels should be confirmed by commencing the boring using dry auger techniques until ground water is encountered before setting casing and switching to wet rotary drilling for the remainder of the borehole. The boring should be completely sealed with a lean bentonite-cement slurry from the borehole bottom upwards via tremie pipe upon completion.
- Lab testing from the test borings should focus on refining the estimated parameters included in Tables 1 and 2.
- One third of the borings can be substituted by Cone Penetration Tests (CPTs). Additional details and benefits of the CPT method can be provided upon request.
- For each crossing, a bathymetric survey should be completed. This should determine the existing river bottom contours at 1-ft intervals, within 50 feet up and downstream of the bores. This survey should also incorporate sub-bottom profiling (intermediate penetration capacity) and a magnetometer survey.

LIMITATIONS

This report has been prepared to provide review comments for the subject 30% HDD designs developed by Kimley-Horn. Detailed HDD and pipe design are beyond the scope of our services. Final designs are the responsibility of others.

CONCLUDING COMMENTS

This DRAFT report has been prepared for specific application to the proposed forcemain HDD crossing installations as described herein. In the event that changes in the proposed installation occur, the conclusions and recommendations contained in this report should be reviewed and modified or verified in writing.

Please feel free to contact the undersigned if there are any questions regarding the contents of this report.

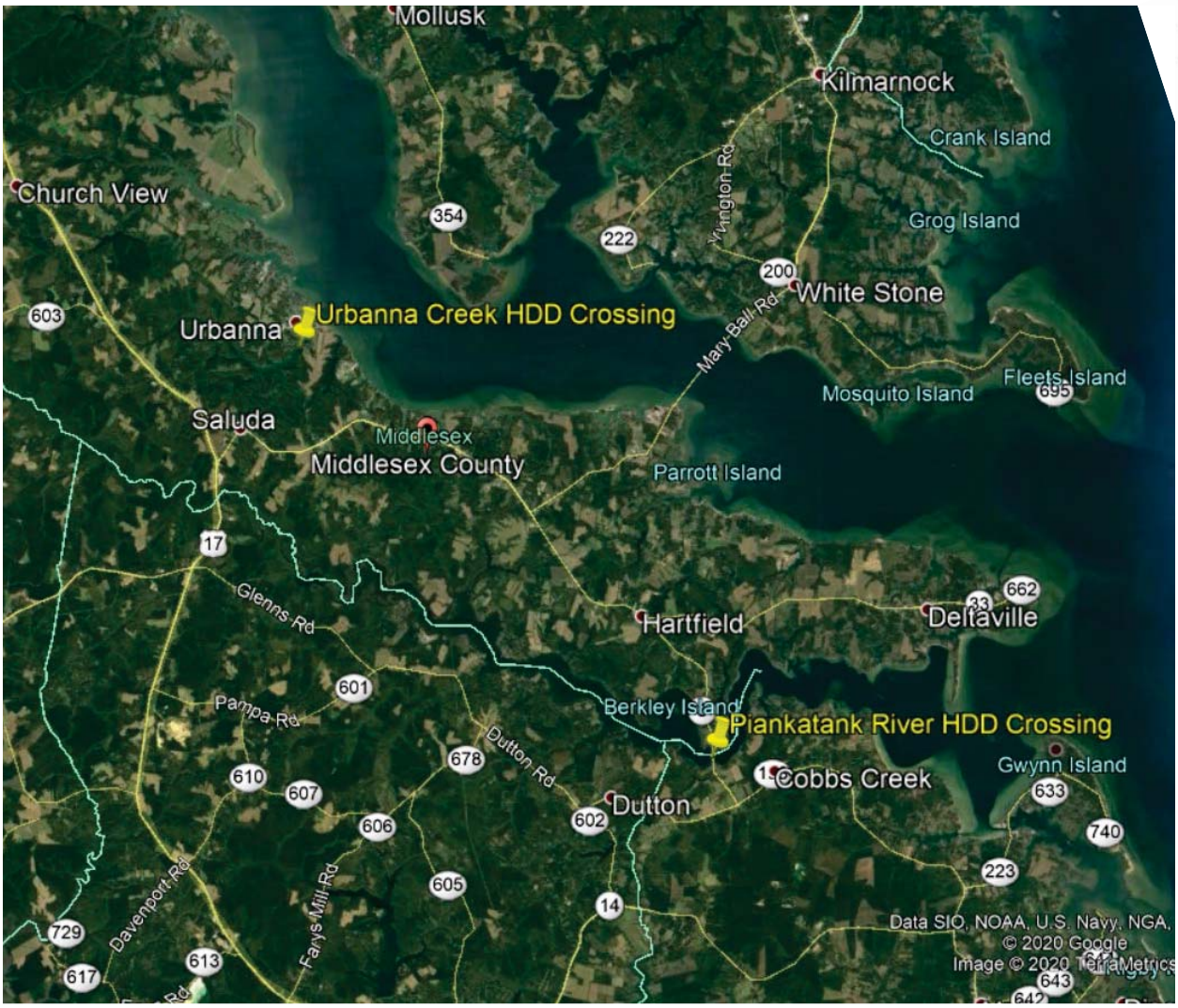
Sincerely,
BRIERLEY ASSOCIATES

David Sackett, C.P.G.
Senior Consultant

Jim Williams, P.E.
Associate

Nick H. Strater, P.G.
Trenchless Practice Principal

BRIERLEY ASSOCIATES
Creating Space Underground



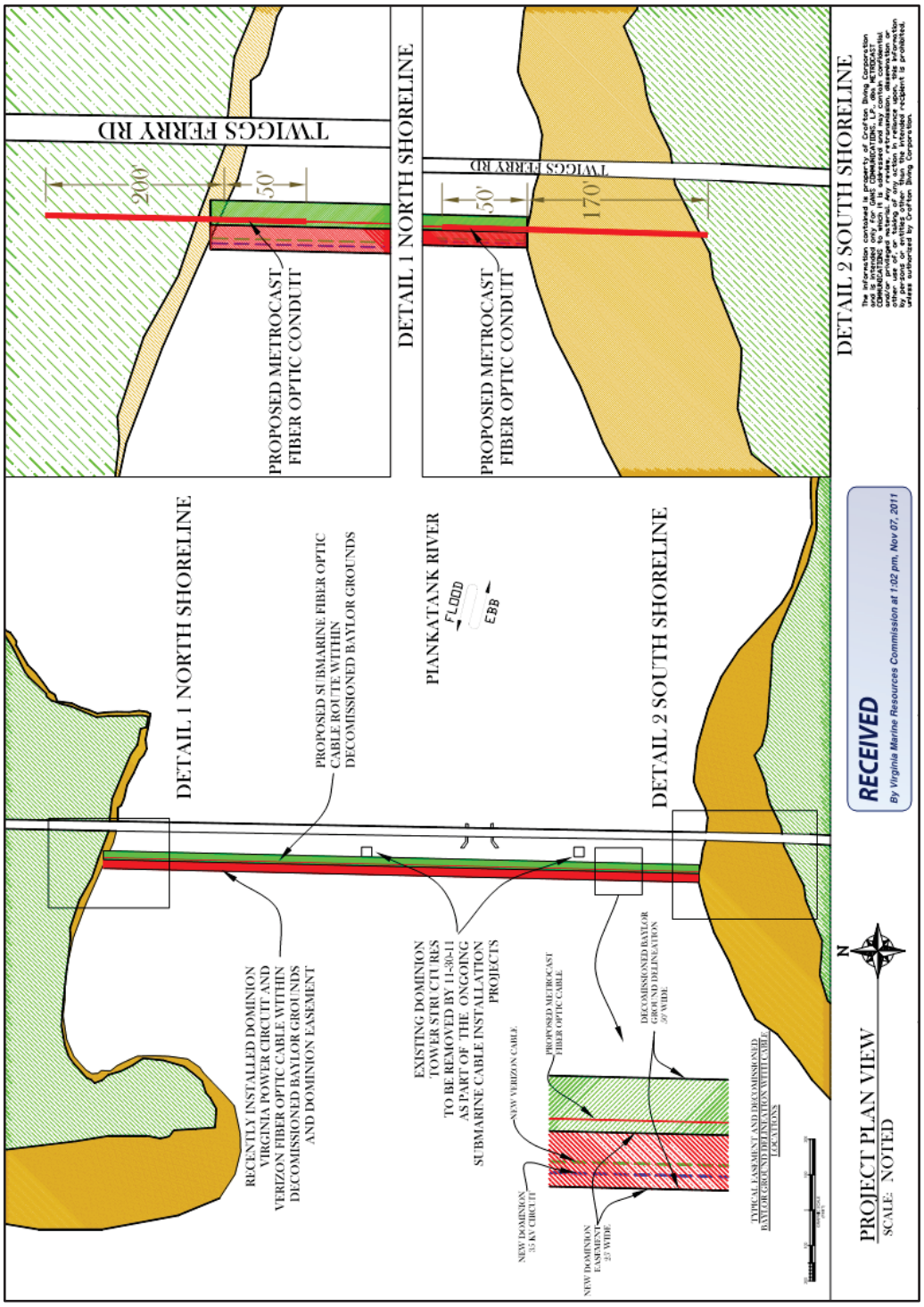
From: Google Earth Pro (2020) Scale 1" = ~3.7 miles

HDD Crossings shown by yellow placemarkers

OVERVIEW OF PROJECT AREA
MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II
MIDDLESEX COUNTY, VIRGINIA

BRIERLEY ASSOCIATES
Creating Space Underground

Figure 1

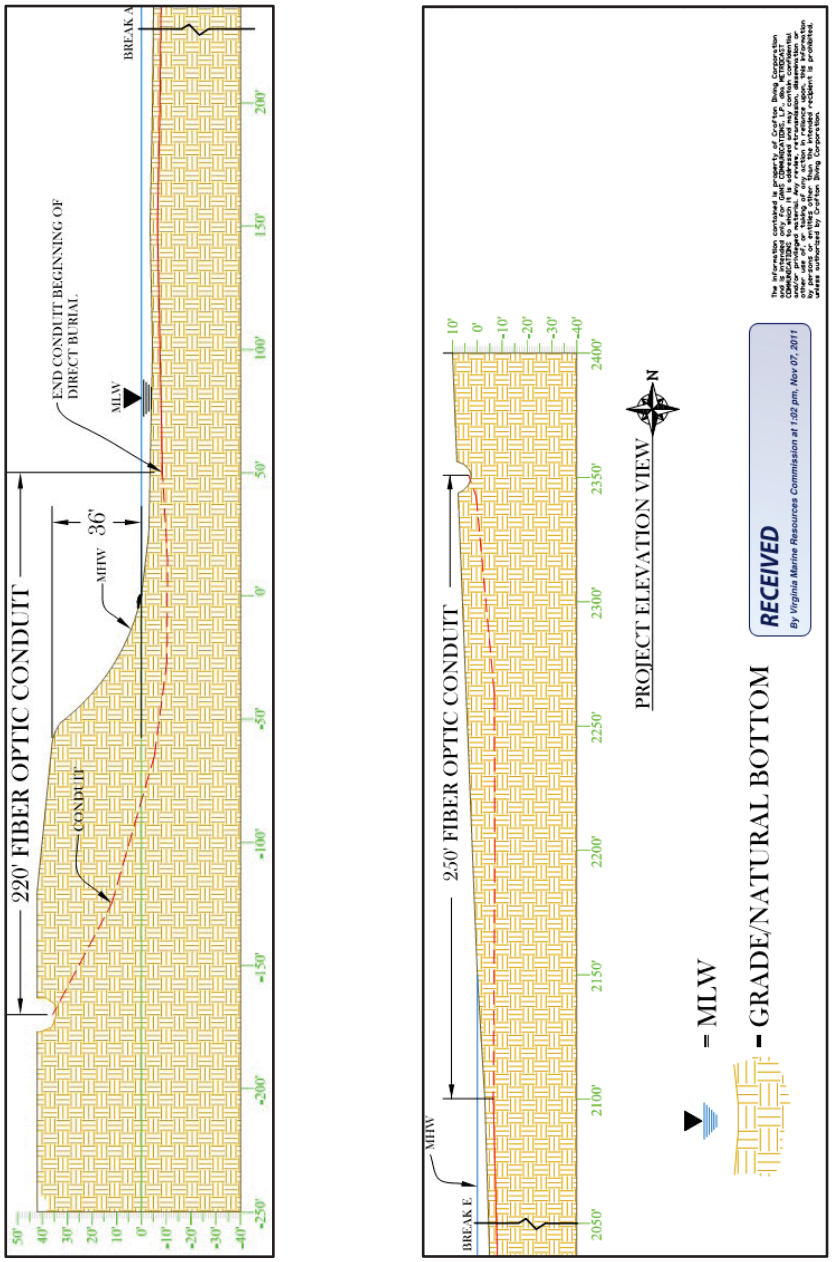


From: Gans Communications, L.P. DBA Metrocast Fiber Optic Cable Joint Permit Application (2011)

FIBER OPTIC CABLE INSTALLATION AT PIANKATANK RIVER CROSSING (2011)
MIDDLESEX INTERCEPTOR SUBAQUEOUS HDD FEASIBILITY STUDY
Middlesex County, Virginia

BRIERLEY ASSOCIATES
Creating Space Underground

Figure 2a

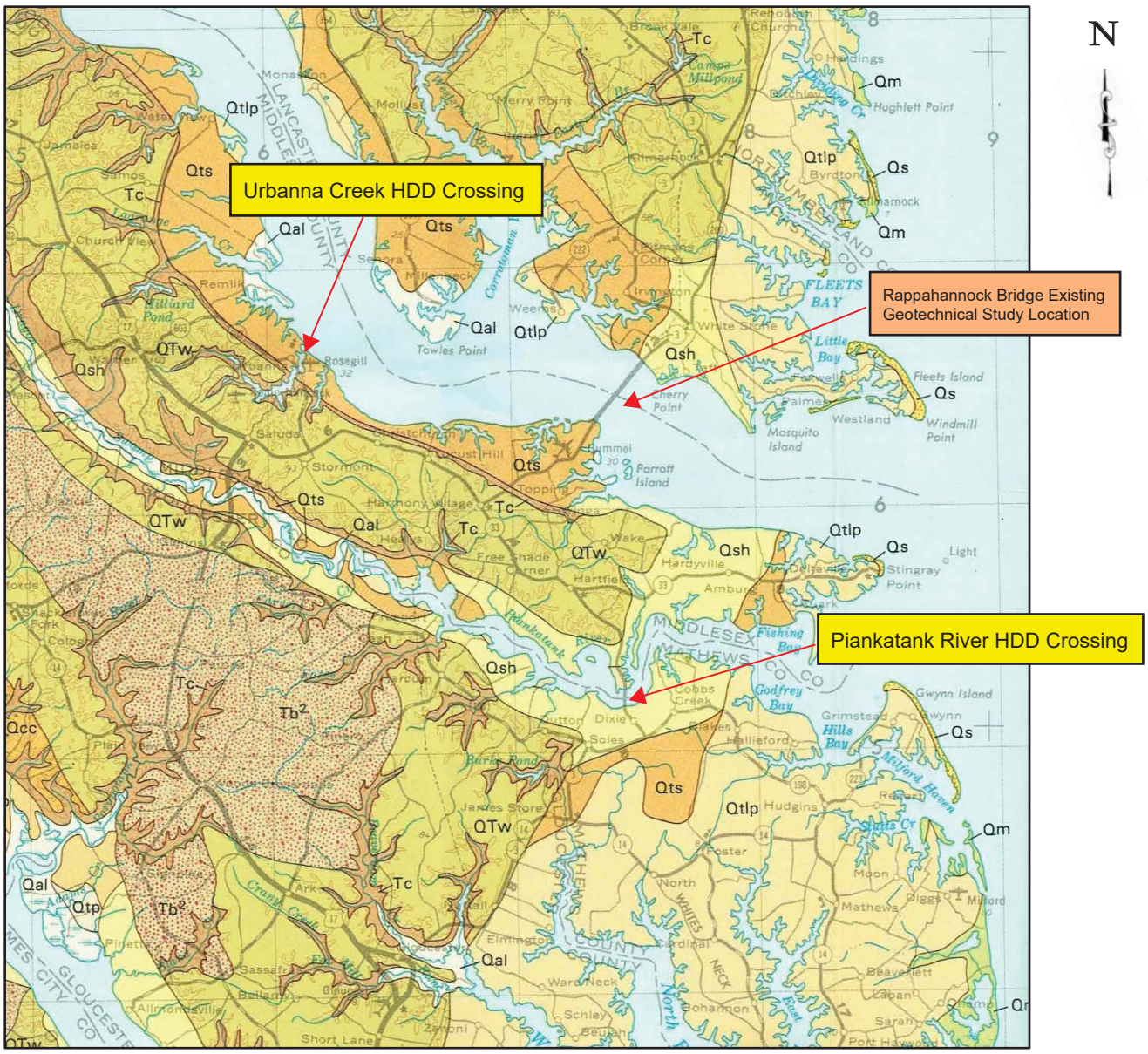


From: Gans Communications, L.P. DBA Metrocast Fiber Optic Cable Joint Permit Application (2011)

FIBER OPTIC CABLE INSTALLATION AT PIANKATANK RIVER CROSSING (2011)
MIDDLESEX INTERCEPTOR SUBAQUEOUS HDD FEASIBILITY STUDY
Middlesex County, Virginia

BRIERLEY ASSOCIATES
Creating Space Underground

Figure 2b



From: Mixon, et.al. (1989) Scale = 1" = 22,500 ft (approx.)

Qtlp = Quaternary Tabb Formation, Lynnhaven and Poquoson Members, undiff. (Upper Pleistocene)
Qts = Quaternary Tabb Formation, Sedgfield Member (Upper Pleistocene)
Qsh = Quaternary Shirley Formation (Middle Pleistocene)
Tc = Tertiary Chesapeake Group (Upper Pliocene to Lower Miocene)

GEOLOGY OF PROJECT AREA
MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II
MIDDLESEX COUNTY, VIRGINIA

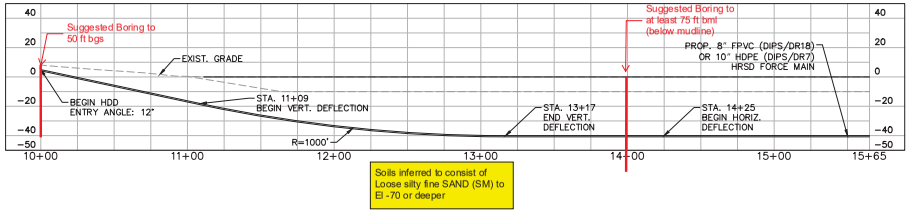
BRIERLEY ASSOCIATES
Creating Space Underground

Figure 3

APPENDIX A – PLAN AND PROFILE SHEETS

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80



Soils inferred to consist of Loose silty fine SAND (SM) to El -70 or deeper

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

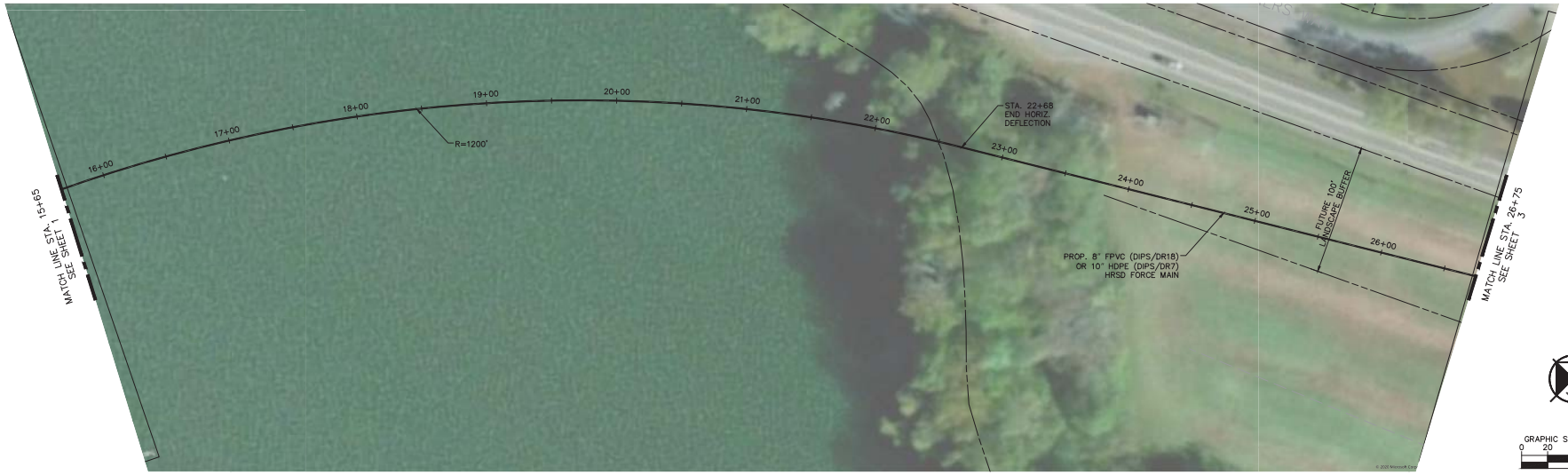
NO.	DATE	BY	REVISION

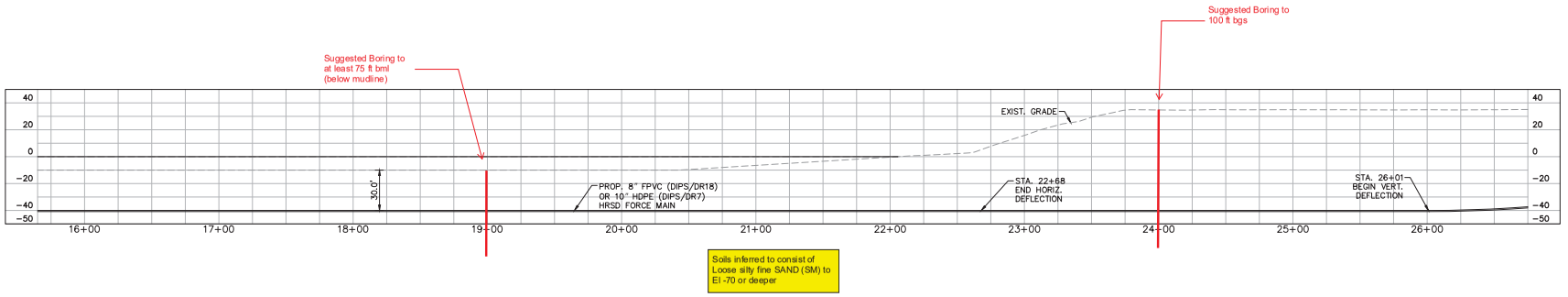
URBANNA CREEK HDD

STA. 10+00 - 15+65

HAMPTON ROADS SANITATION DISTRICT

DESIGNED BY:	DATE:
DRAWN BY:	FILE NO.:
CHECKED BY:	DRAWING NO.: 1
SCALE:	SHEET NO.: of xxx





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

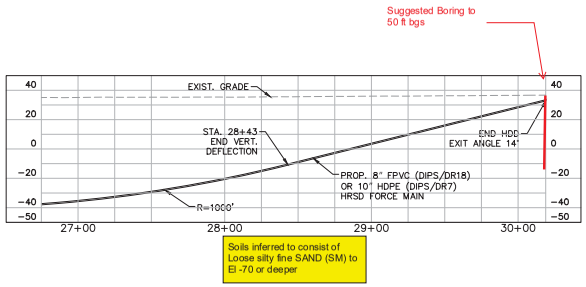
HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

URBANNA CREEK HDD
STA. 15+65 - 26+75

HAMPTON ROADS SANITATION DISTRICT

DESIGNED BY:	DATE:
DRAWN BY:	FILE NO.:
CHECKED BY:	DRAWING NO.: 2
SCALE:	SHEET NO.: of xxx



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

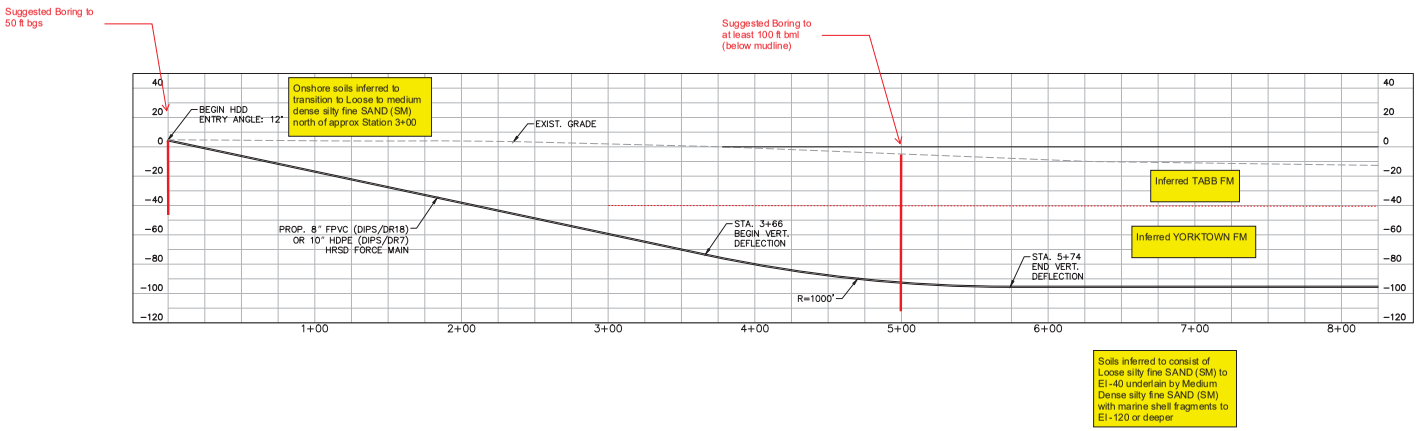
HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

URBANNA CREEK HDD
STA. 26+75 - 30+19

HAMPTON ROADS SANITATION DISTRICT

DESIGNED BY:	DATE:
DRAWN BY:	FILE NO.:
CHECKED BY:	DRAWING NO.: 3
SCALE:	SHEET NO.: of xxx



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

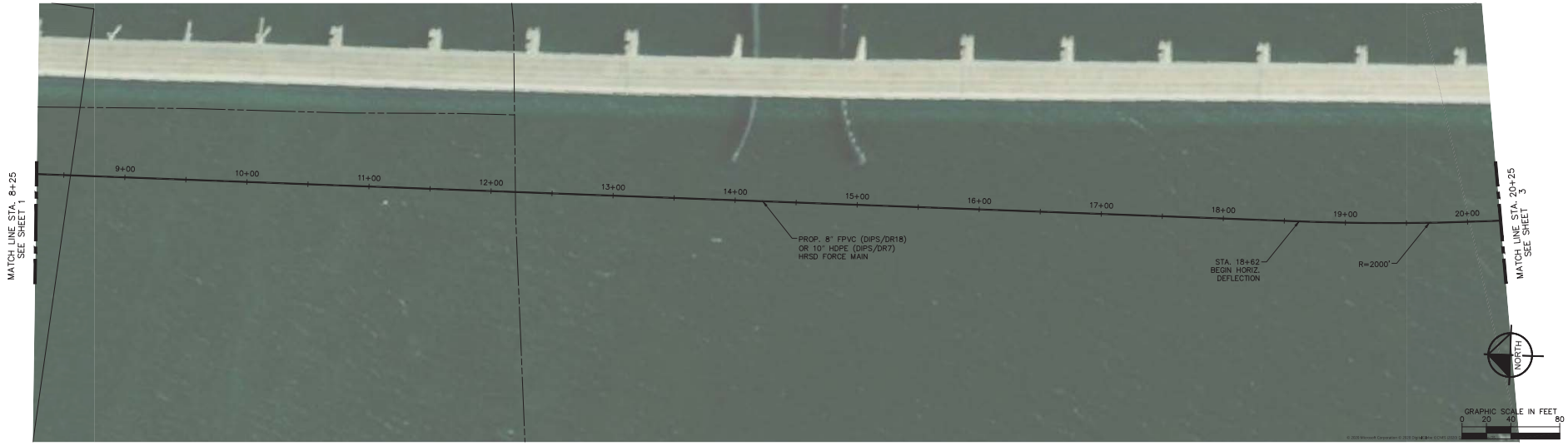
HRSD
Cleaning wastewater every day for a better Bay

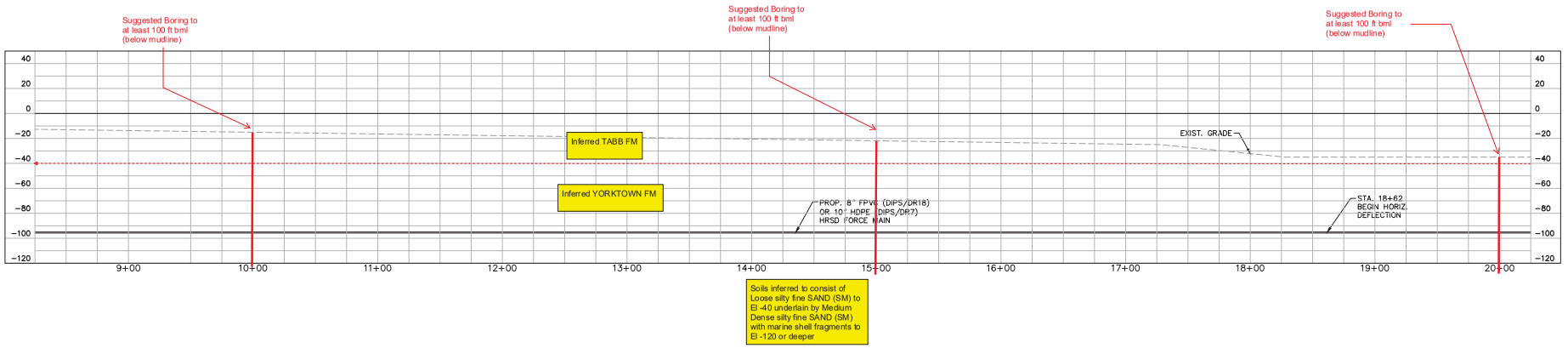
NO.	DATE	BY	REVISION

PIANKATANK RIVER HDD
STA. 0+00 - 8+25

HAMPTON ROADS SANITATION DISTRICT

DESIGNED BY:	DATE:
DRAWN BY:	FILE NO.:
CHECKED BY:	DRAWING NO.: 1
SCALE:	SHEET NO.: of xxx





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

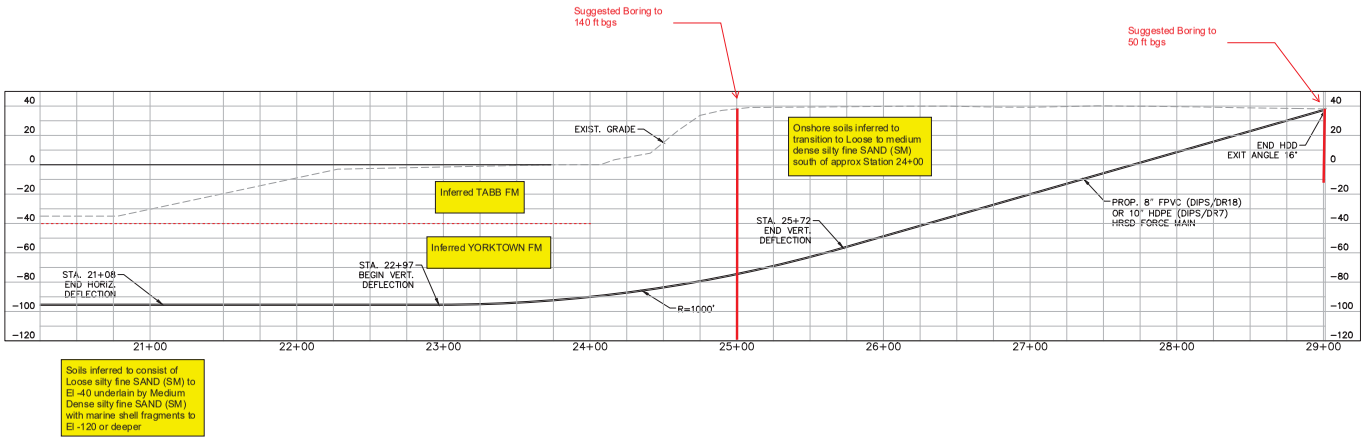
HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

PIANKATANK RIVER HDD
STA 8+25 - 20+25

HAMPTON ROADS SANITATION DISTRICT

DESIGNED BY:	DATE:
DRAWN BY:	FILE NO.:
CHECKED BY:	DRAWING NO.: 2
SCALE:	SHEET NO.: of xxx



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

PIANKATANK RIVER HDD
STA. 20+25 - 29+01

HAMPTON ROADS SANITATION DISTRICT

DESIGNED BY:	DATE:
DRAWN BY:	FILE NO.:
CHECKED BY:	DRAWING NO.: 3
SCALE:	SHEET NO.: of xxx