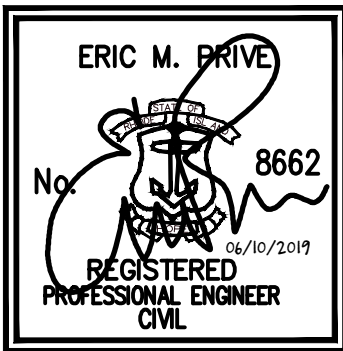

Hillside Commons
Sewer Feasibility Study &
Downstream Carrying Capacity Analysis
South Kingstown, Rhode Island

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Introduction

Hillside Commons (Site) is proposed as a residential project located on approximately 2.97 acres located off Kelley Way. The residential development plan proposes the construction of an 18 unit condominium development consisting of a mixture of multi and single-family homes.

The sewer connection was analyzed using the criteria found in the Code of Ordinances for the Town of South Kingstown, Chapter 19, Article II, Sec. 19-115 (1)(a). A report titled "Sanitary Sewer Impact Analysis for Wakefield Meadows; Tower Hill Road (Route 1); South Kingstown, RI; December 2004" prepared by Crossman Engineering, Inc. for John Haddad of 2790 South County Trail, East Greenwich, RI 02818 for a large development located upstream from the Site was also referenced.

1.0 Conformity to Town of South Kingstown Comprehensive Plan

The proposed residential project is within the Future Sewer Service area which is depicted within Figure 6.2 of the Town's Comprehensive Community Plan (CCP). This is an area of the Town where public sewer service is recommended for any significant new development. The Town of South Kingstown Comprehensive Community Plan specifies that individual developments must be reviewed on a case-by-case basis in order to determine if it is feasible to extend public sewers.

2.0 Areas of Existing OWTS Problems and Failures

Areas of existing OWTS problems and failures proves not to be applicable to this project. Existing information shows that the area surrounding the site is already serviced by public sewer. Using the Town of South Kingstown's Comprehensive Community Plan, it has been determined that the project is to utilize public sewer. This is further confirmed by The State of Rhode Island and Providence Plantations Department of Environmental Management's Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatments Systems establishes in Rule 14.5 that OWTS systems would not be approved for this project. Rule 14.5 is as follows:

14.5 Connection to a Public Wastewater System- An OWTS application shall not be approved if such OWTS is proposed to serve a premises for which a public wastewater system is reasonably accessible as determined by the Director, and for which permission to enter the public wastewater system can be obtained from the authority having jurisdiction. The Director shall require the owner or occupant to connect the structure to a public wastewater system within a specified period of time if the following occur:

14.5.1 The OWTS is failing;

14.5.2 Public wastewater system is reasonably accessible as determined by the Director; and

14.5.3 Permission to connect to the public wastewater system can be obtained from the authority having jurisdiction over it.

Using local and state regulations it is believed that OWTS systems for the project are not a viable option and that connecting to public sewer is the best option for the project.

3.0 Soil Conditions Not Suitable for OWTS Placement

RIDEM OWTS Regulations Rule 14.5 states that OWTS systems are not an option for this project as shown in the previous section. However, the soils information for this project have been added to this report for reference. Information from Soil Evaluations that were performed on site show that ledge depths on site are greater than 8 feet. There are two different soil types located in the area of the Site as mapped by the USDA Soil Conservation and the soil types are described as follows:

<u>Soil Symbol</u>	<u>Description</u>	<u>Hydrologic Group</u>
BrB	Broadbrook silt loam, 3 to 8 percent slopes	C
RaB	Rainbow silt loam, 3 to 8 percent slopes	C

The RI Soil Survey describes these soils as follows:

BrB – Broadbrook silt loam, 3 to 8 percent slopes - This gently sloping, well-drained soil is on the side slopes of glacial upland hills and drumlins. The permeability of this soil is moderate in the surface layer and subsoil and slow or very slow in the substratum. This soil is suitable for community development. The main limitation is the slow or very slow permeability of the substratum. Onsite sewage disposal systems need special design and installation to prevent effluent from seeping to the surface, and roads and streets need careful design to prevent frost heaving.

RaB – Rainbow silt loam, 3 to 8 percent slopes - This gently sloping, moderately well drained soil is on side slopes of glacial upland hills and drumlins. The permeability of this soil is moderate in the surface layer and subsoil and slow to very slow in the substratum. This soil is suitable for community development. The main limitations for this use are the slow to very slow permeability in the substratum and the seasonal high water table. Onsite sewage disposal systems need special design and installation. Subsurface drains can be used to help prevent wet basements, and roads and streets need careful design to prevent frost heaving.

4.0 Proximity to Wetlands, Coastal Ponds, Groundwater Resources & Other Environmental Sensitive Areas

The proposed development is approximately 2.97 Acres and is located on Kelley Way, which is west of Route 1 and north of Old Tower Hill Road. There are no wetlands located on the parcel.

This site is not located within any of the following areas: Natural Heritage Areas (RIDEM), Narrow River Special Area Management Plan (CRMC), Salt Ponds Special Area Management Plan (CRMC), Groundwater Protection Overlay District (Town).

The Site is within the Indian Run Brook Watershed. A RIDEM-based study of the watershed has been developed for Copper, Zinc, and Fecal Coliform which exceeds the states standards for water quality, placing the river on the State's 303(d) list of Impaired Waterbodies. (Pathogen TMDL for Saugatucket River, Mitchell Brook, Rocky Brook, and Indian Run Brook, RIDEM, 2003; Indian Run Brook Dissolved Metals Total Maximum Daily Loads, RIDEM, 2008).

The residential development is not proposed with OWTS and the project will not contribute additional pathogens to Indian Run Brook. A Rhode Island Pollutant Discharge Elimination System permit (File No. RIR101821) has been obtained to ensure that the project complies to the program regulations for stormwater water quality treatment and mitigation.

5.0 Existing and/or Planned Municipal Potable Water Line Locations

The site is serviced by municipal public water. Public utilities exist adjacent to the Site along Kelley Way. Suez Water Rhode Island Inc. (SWRI) is the authority with jurisdiction over access to public water in the area of the development. A connection to the existing 12" water main on Kelley Way is proposed for servicing the Site. Confirmation has been received via letter from Suez Water New York Inc. Director of Engineering, NY Division, Paula McEvoy, that both domestic water service and fire protection is available from the Kelley Way water main.

6.0 Economic Feasibility

There are no reasonable alternatives to the proposed sewer connection to the main located in Kelley Way. As such, economic feasibility is not a consideration for this project.

7.0 Lot Size

The Site includes a total of approximately 2.97 acres with frontage on Kelley Way. The Site is located on Assessor's Plat 57-2 Lot 59 and is Zoned Route 1 Special Management District (SMD). The project is proposed as an 18 unit condominium development that will not result in subdivision of the lot.

8.0 Impact on Areas in the Vicinity of the Proposed Main Extension

Future Service Area

According to Figure 6.2 of the Town's Comprehensive Community Plan (CCP) the site is located in a Future Sewer Service Area and is to utilize public sewer.

Property Value

Connection to the existing sewer main will not require an easement and will not diminish the property value of adjacent properties.

Overall Wastewater Flow Rates

The Technical Review Committee (TRC) comments from Department of Public Services also requested that a downstream carrying capacity analysis be performed to determine the ability of the existing wastewater infrastructure to handle the proposed flows. The existing sewer line within Kelley Way is an 8" diameter gravity main with a 3% slope. The existing 8" gravity sewer main within Kelley Way can transmit approximately 2.1 cubic feet per second (cfs) of flow, which equates to approximately 1,357,261 gallons per day (gpd). Hillside Commons is proposing an 18 unit condominium development with an estimate average daily flow of 100 gpd per bedroom. The Route 1 Special Management District zoning requirement allows for a maximum of 2 bedrooms per units; therefore, we have calculated a proposed average daily flow of 3,600 gpd for the development. The 3,600 gpd flow represents 0.3% of the pipe capacity proving to be a negligible impact on the system.

Impact on Receiving Wastewater Treatment Facilities

Flow from this development ultimately discharges to the South Kingstown Regional Waste Water Treatment Facility. The South Kingstown Regional Waste Water Treatment Facility serves Narragansett, South Kingstown, and URI. RIDEM Wastewater Treatment Facilities documentation states that this treatment plant services approximately 29,400 people, has a design flow of 5.0 million gallons per day and an average daily flow of 2.4 million gallons per day. The proposed development design flow of 3,600 gpd is an approximate 0.15% increase to the average daily flow and the additional 45 people is an increase of approximately 0.15% increase to the South Kingstown treatment facility. The South Kingstown WWTF will not be impacted by the proposed 18 unit condominium development.

Relation to Previous Sanitary Sewer Impact Analysis

The Wakefield Meadows development, consisting of a 142 unit age-restricted residential community, a hotel, and a conference center, is located within 250 feet of the Site. As part of the approval for that development, a report titled "Sanitary Sewer Impact Analysis for Wakefield Meadows; Tower Hill Road (Route 1); South Kingstown, RI; December 2004" prepared by Crossman Engineering, Inc. for John Haddad of 2790 South County Trail, East Greenwich, RI 02818 was submitted. The report includes potential future flow from nearby undeveloped land including, but not limited to, Lots 57, 58, and 59 on Assessor's Plat 58-1. The report demonstrates that the existing sewer network would be able to handle a total projected flow from these parcels of 52,500 gpd in addition to the total projected flow from the Wakefield Meadows development. The proposed design flow of 3,600 gpd from Hillside Commons would account for 6.8% of the total projected flow for these parcels, which is within the assumed future values.

9.0 Potential Effect on Private or Municipal Potable Water Groundwater Wells Within the Future

It has been determined that a proposed sewer connection would not affect any groundwater wells being that there are none in the area. RIDEM OWTS regulations state in Rule 14.5 that OWTS systems are not feasible options for this project which entirely rules out the potential effect on groundwater wells by OWTS systems. Information from RIDEM and the Town of South Kingstown was used for this determination.

10.0 Conclusion

After reviewing the criteria found in the Code of Ordinances for the Town of South Kingstown, Chapter 19, Article II, Sec. 19-115 (1)(a) and considering RIDEM OWTS Regulations Rule 14.5, connecting to the sewer main in Kelley Way is the only feasible option.

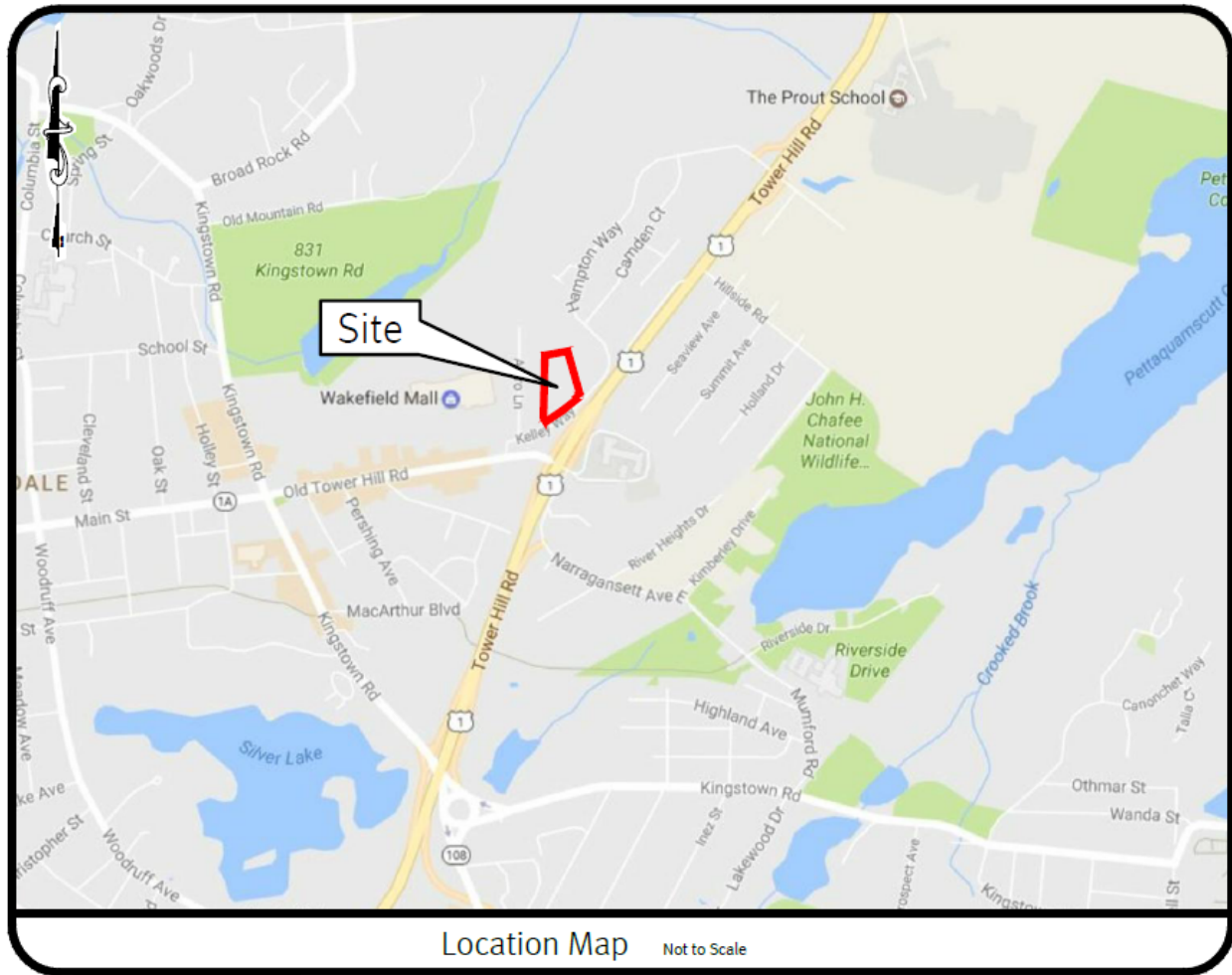
Factors for generating conclusion:

- Surrounding properties are connected to the public sewer lines by means of gravity or sewer force main (via Wakefield Meadows)
- The project is within the Town of South Kingstown's Comprehensive Community Plan Future Sewer Service Area
- Projected flow from the project accounts for negligible percentage of the anticipated future flow accounted for in the Sanitary Sewer Impact Analysis for the approved Wakefield Meadows project
- Ledge excavation is not anticipated
- The Kelley Way sewer main can adequately convey the additional wastewater flow from the project
- The Kelley Way sewer line is downgradient of the Site, which provides optimal elevations to extend a gravity sewer to the proposed development
- Adheres to RIDEM OWTS Regulations Rule 14.5 that rules out the option of individual OWTS
- The project does not abut any other streets

It is understood that there is town concern regarding the fecal coliform concentrations to Indian Run Brook per the Total Maximum Daily Loading (TMDL) report of the area. The Hillside Commons project proposes to connect to the existing Kelley Way sewer main, which results in the elimination of any potential contamination from Fecal Coliform that may result from OWTS leachfields.

In conclusion, the project provides a gravity sewer line that will serve the proposed development and connects to the existing Kelley Way gravity sewer main. It is DiPrete Engineering's professional opinion that a gravity sewer line connection to Kelley Way has been proven to be the most feasible option for the Hillside Commons project.

Appendix A: Locus Map



Appendix B: Town Ordinance

Sec. 19-115. Connection policy.

The town hereby establishes the following policy relative to future connections to the sewer system:

(1) *Property within the existing and/or future sewer service area.* Any parcel of land located within the existing and/or future sewer service area as defined in figure 6.2 entitled "Sewer Service Areas," of the Town of South Kingstown Comprehensive Community Plan, may be required to connect to the sanitary sewer system. The property owner agrees to abide by all conditions, restrictions, standards, specifications, design criteria, and to pay all fees which may be established by the town. The property owner shall also pay any cost(s) associated with sewer service connection and/or sewer main extensions.

a. Property located along and abutting an existing sewer line shall be governed by section 19-33.

b. Property not located along and not abutting an existing sewer line where the property will require a sewer line extension shall be governed by section 19-111 and the following:

1. The utilities director may require that property(s) proposed for development be required to connect to the sanitary sewer system provided the following conditions are met: i.) satisfactory grades are established meeting the approval of the utilities director, and ii.) permanent rights-of-way and easements are granted to the town (where required).

2. The utilities director shall consider the following criteria in determining if a mandatory connection and/or sewer main extension is required:

- (i) Conformity to Town of South Kingstown Comprehensive Plan.
- (ii) Areas of existing ISDS problems or failures.
- (iii) Soil conditions not suitable for ISDS placement.
- (iv) Proximity to wetlands, coastal ponds, groundwater resources and other environmentally sensitive areas.
- (v) Existing and/or planned municipal potable waterline locations.
- (vi) Economic feasibility.
- (vii) Lot size.
- (viii) Impact on areas in the vicinity of the proposed main extension.
- (ix) Potential effect on private or municipal potable water groundwater wells within the future.

3. if connection is mandated, then the individual property owner(s) must submit an extension request under the following procedure. The owner of property, or his agent, shall apply in writing to the utilities department giving the following information:

- (i) Name.
- (ii) Street.
- (iii) Address.

- (iv) Assessor's plat and lot.
- (v) Proposed use of property.
- (vi) Number of units (residential).
- (vii) Proposed daily wastewater flow (nonresidential).

c. Individual sewer lift or pumping stations will be subject to approval by the utilities director. Only pressure connections to individual lots constructed perpendicular to a gravity sewer main will be considered. The pressure sewer line shall transition to a gravity sewer lateral at the applicant's property line. Community low-pressure sewer mains and/or laterals serving more than one (1) property is prohibited.

d. An applicant requesting sewer main extensions within the existing and/or future sewer service area shall prepare an engineering study at applicant's expense by a registered professional engineer delineating various wastewater methodologies satisfactory to the utilities director. This study shall address, as a minimum, the criteria identified in subsection (1)b.2 to the satisfaction of the utilities director. This document will be subject to applicable local, state and federal regulations.

e. The requested sewer connection must demonstrate that the existing sewer main designated for extension is of sufficient capacity to properly accommodate the projected sewer flows as determined by the utilities director.

f. All sewer main extensions for land subdivisions as defined in the Subdivision Regulations of the Town of South Kingstown shall be subject to planning board approval.

g. The utilities director may waive the requirement for mandatory sewer connection when in the opinion of the director sufficient evidence indicates that sewer connection is not feasible based upon criteria delineated in subsections (1) b.2 and (1)c–e.

(2) *Properties abutting or beyond the future sewer service area.* Any applicant requesting sanitary sewers for property(s) either abutting or beyond the future sewer service area which meets the criteria delineated for such extensions in the comprehensive plan may be permitted. The applicant for said extension shall submit an application to the town clerk for amendment to the future sewer service area map of the comprehensive plan in accordance with the procedure set forth in chapter 45-22.2 of the General Laws, the Rhode Island Comprehensive Planning and Land Use Regulation Act. The application for amendment to the comprehensive plan shall be accompanied by all information required under subsection (1)b.

(3) *Appeals.* Appeals contrary to the utilities director's decision regarding sanitary sewer connection shall be made to the town manager.

(4) *Property owner/developer obligations.* The following obligations apply to all sewer line connections:

a. The property owner and/or developer agrees to abide by all conditions, restrictions, standards, specifications, design criteria and to pay all fees which may be established by the town and/or the State of Rhode Island. All costs for sewer main extensions shall be paid for by the developer and/or property owner, including pipelines and services, and will not be entitled to any refunds or rebates.

b. The developer's contractor shall submit evidence satisfactory to the utilities