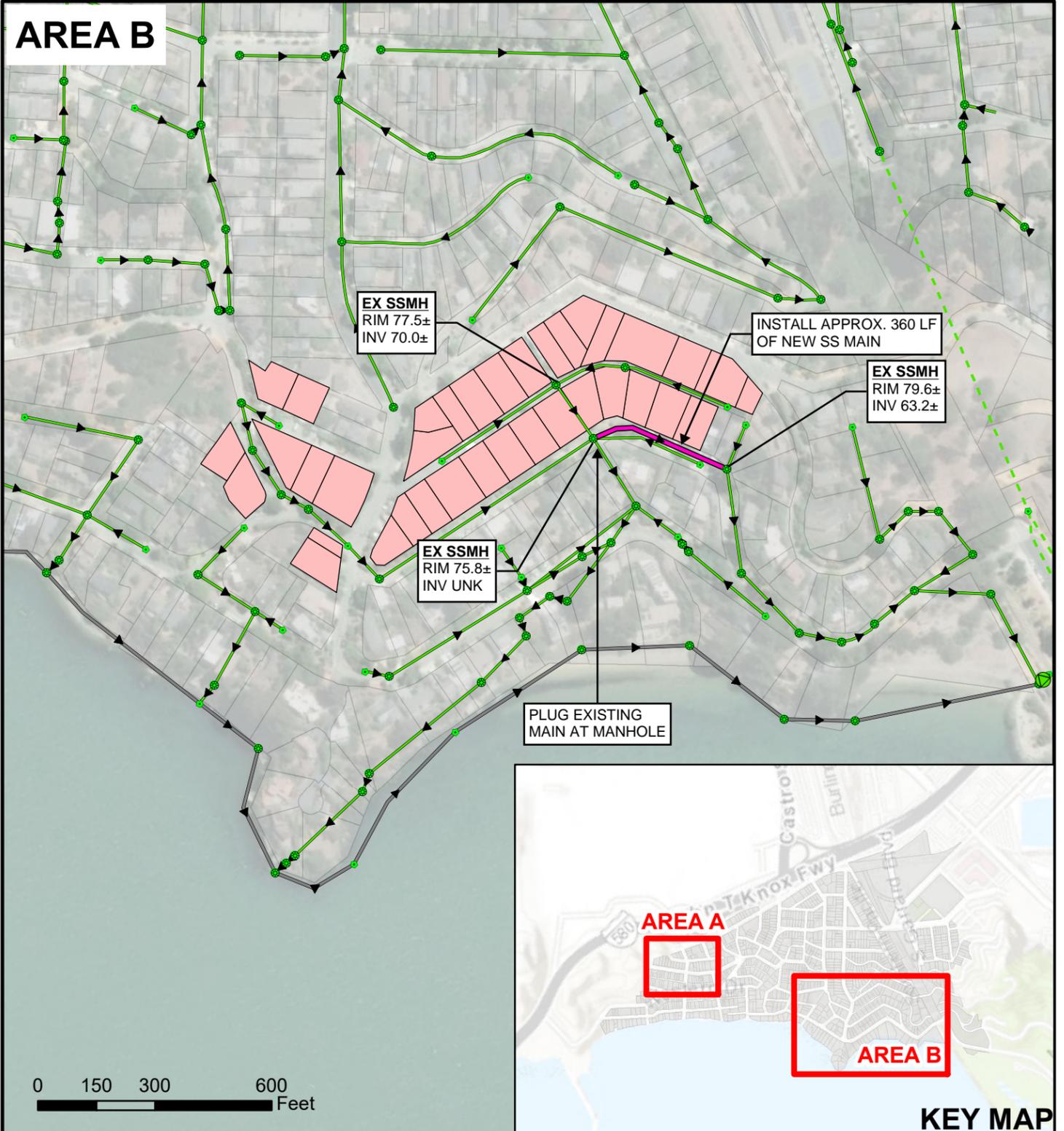
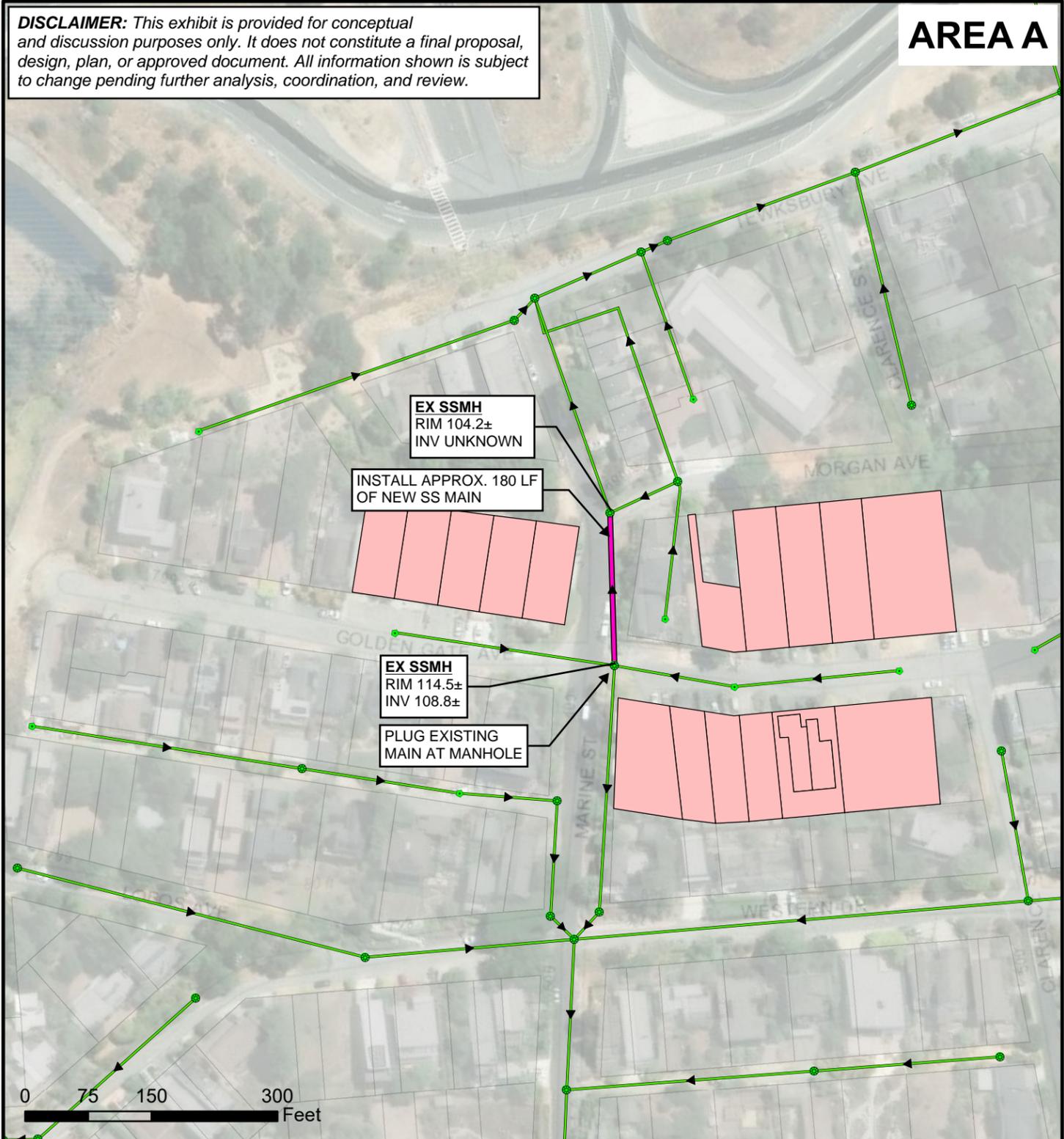


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**CITY OF RICHMOND
KBSS REALIGNMENT STUDY
A1 - GRAVITY FLOW (INTERIM)**

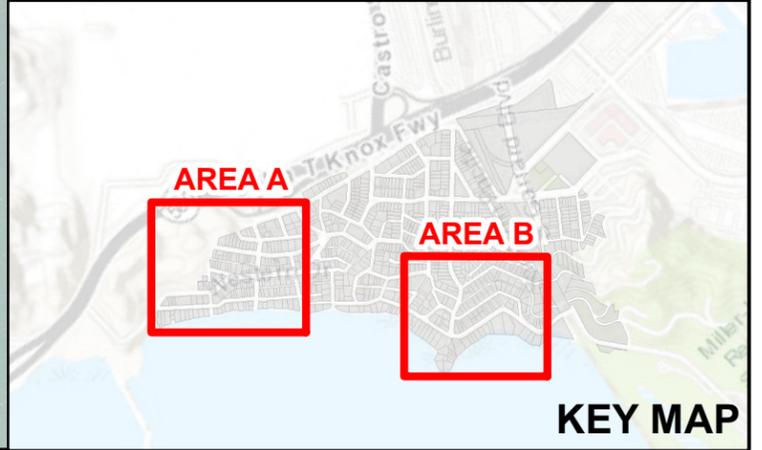
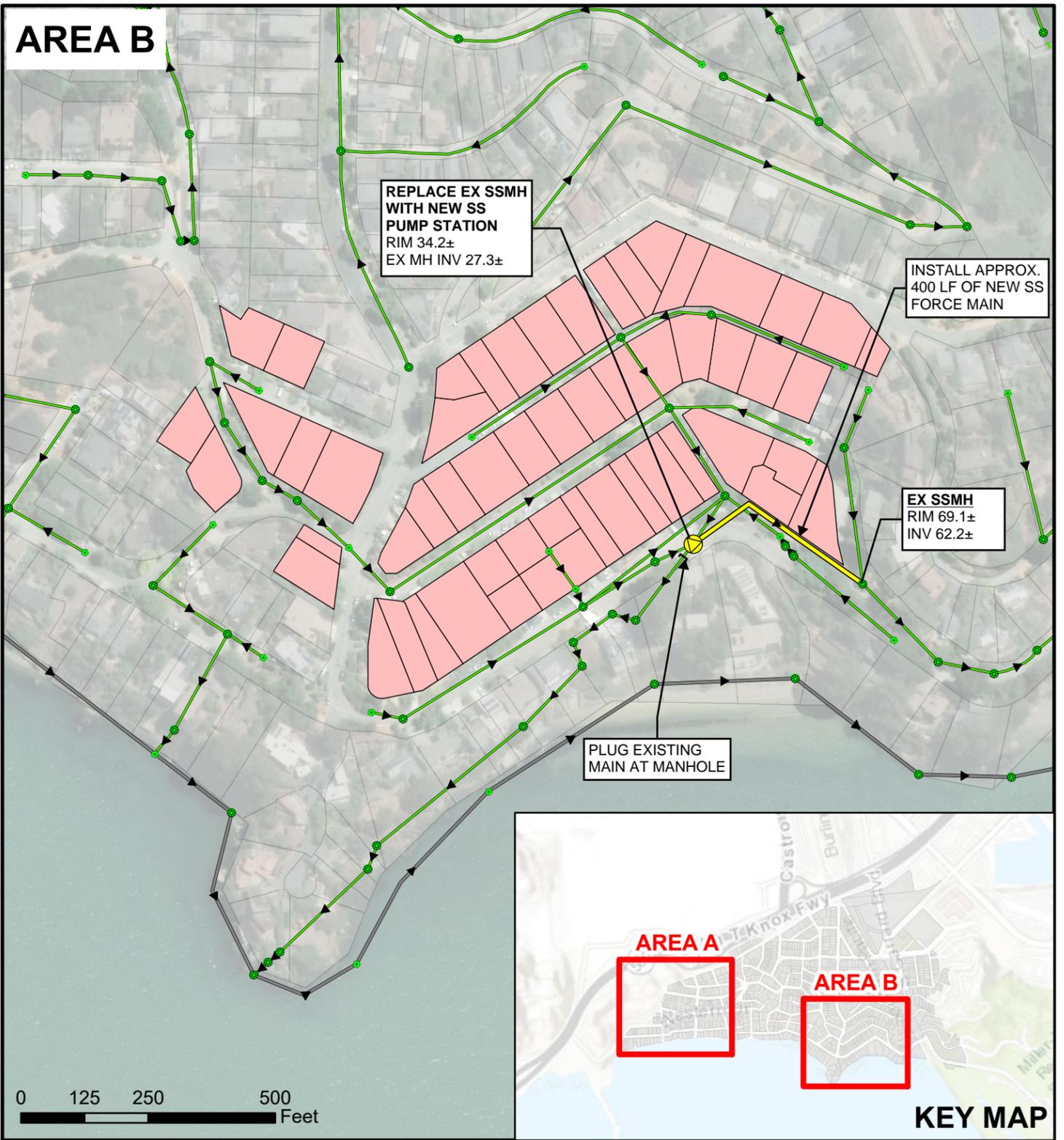
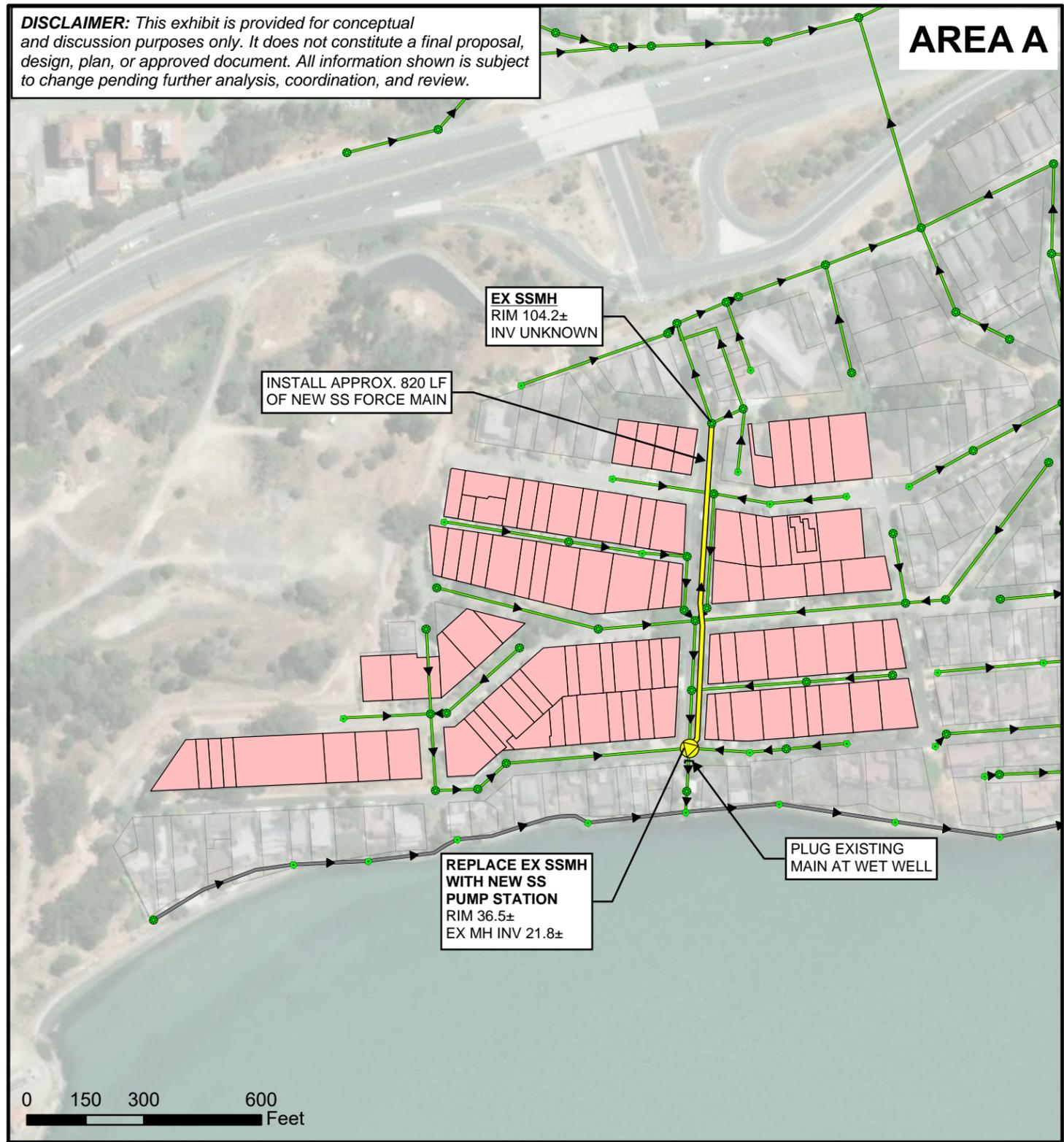
- | | |
|------------------------------|------------------------------|
| EXISTING SEWER SYSTEM | PROPOSED SEWER SYSTEM |
| Pump Station | New Gravity Main |
| Manhole | Rerouted Parcel* (52 Total) |
| Lamphole | |
| Gravity Main | |
| Keller Beach Interceptor | |
| Parcel | |

NOTE: All elevations shown are per City-provided GIS, where available.

* Indicates a parcel that is currently estimated to have its sewer flow directed away from the Keller Beach Sewer Line if the alternative was implemented



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**CITY OF RICHMOND
KBSS REALIGNMENT STUDY
A2 - PUMPED FLOW (INTERIM)**

- | | |
|------------------------------|------------------------------|
| EXISTING SEWER SYSTEM | PROPOSED SEWER SYSTEM |
| Pump Station | New Pump Station |
| Manhole | New Force Main |
| Lamphole | Rerouted Parcels |
| Gravity Main | |
| Keller Beach Interceptor | |
| Parcel | |

NOTE: All elevations shown are per City-provided GIS, where available.

* Indicates a parcel that is currently estimated to have its sewer flow directed away from the Keller Beach Sewer Line if the alternative was implemented



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**CITY OF RICHMOND
KBSS REALIGNMENT STUDY
A3 - PUMPED FLOW (FINAL)**

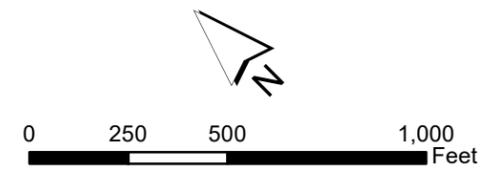
EXISTING SEWER SYSTEM

- Pump Station
- Manhole
- Lamphole
- Keller Beach Interceptor
- Gravity Main
- Force Main

PROPOSED SEWER SYSTEM

- New Pump Station
- New Manhole
- New Force Main
- New Gravity Main
- Parcel May Require Private Lift Station

NOTE: All elevations shown are per City-provided GIS, where available.



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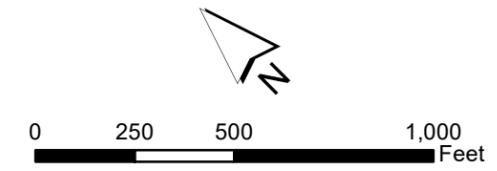
Rehab Methods Considered:
 1. Cured-In-Place-Pipe (CIPP)
 2. Sliplining with HDPE
 3. Sliplining with Fold n Form PVC

Includes rehabilitation of manholes and restoration of concrete encasement

Lampholes not replaced with MHs would be replaced with straight pipe prior to lining

CITY OF RICHMOND
KBSS REALIGNMENT STUDY
B1 - REHABILITATE EXISTING PIPE

- | EXISTING SEWER SYSTEM | | PROPOSED SEWER SYSTEM | |
|-----------------------|--------------|-----------------------|---------------------------------|
| | Pump Station | | New Manhole |
| | Manhole | | Rehabbed Manhole (Existing) |
| | Lamphole | | Rehabbed Interceptor (Existing) |
| | Gravity Main | | |
| | Force Main | | |

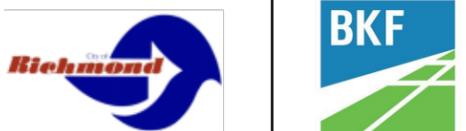
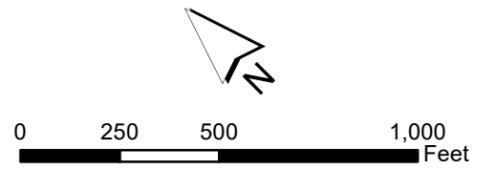


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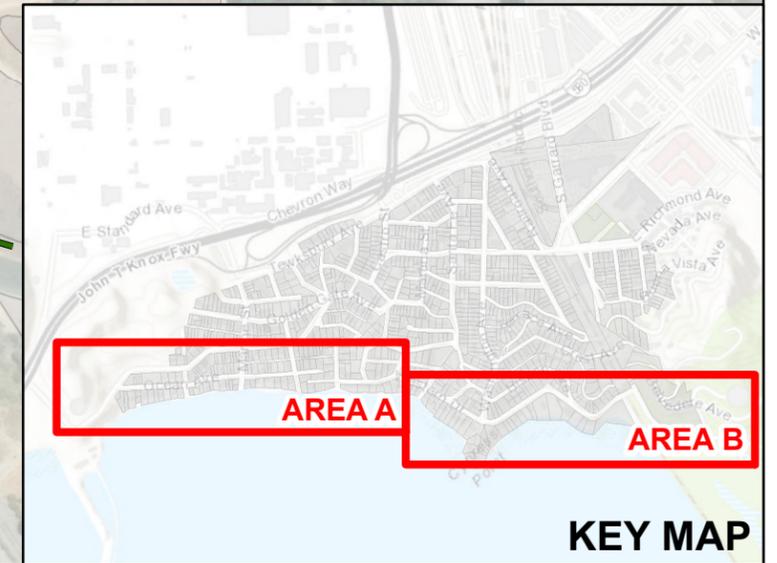
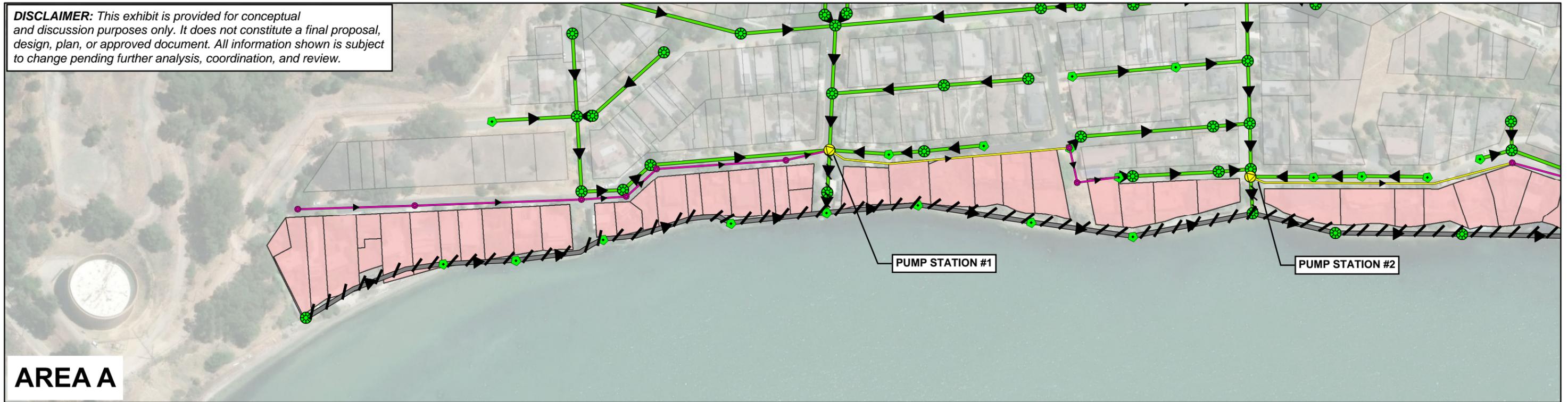


CITY OF RICHMOND
KBSS REALIGNMENT STUDY
B2 - CONSTRUCT NEW PIPE

- | | |
|------------------------------|------------------------------|
| EXISTING SEWER SYSTEM | PROPOSED SEWER SYSTEM |
| ● Pump Station | ● New Manhole |
| ● Manhole | — New Interceptor |
| ● Lamphole | |
| — Gravity Main | |
| — Force Main | |



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**CITY OF RICHMOND
KBSS REALIGNMENT STUDY
C1 - TRADITIONAL OPEN-CUT
WITH PUMP STATIONS**

EXISTING SEWER SYSTEM

- Pump Station
- Manhole
- Lamphole
- Keller Beach Interceptor
- Gravity Main
- Force Main

PROPOSED SEWER SYSTEM

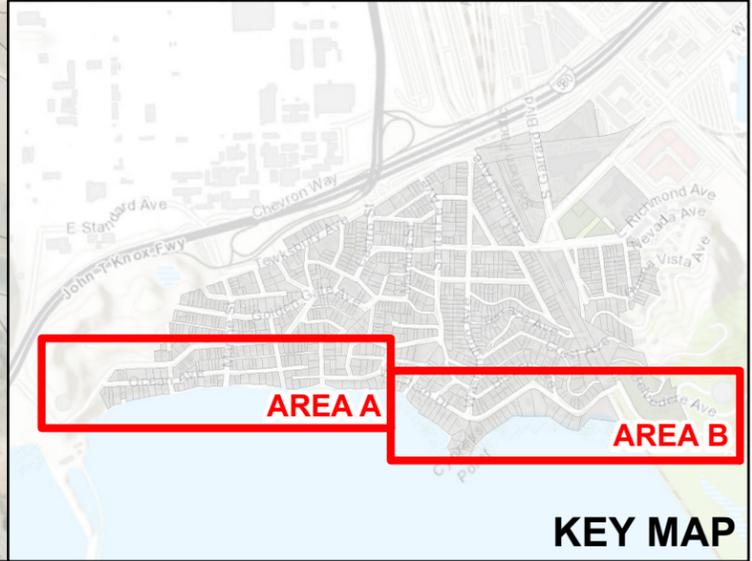
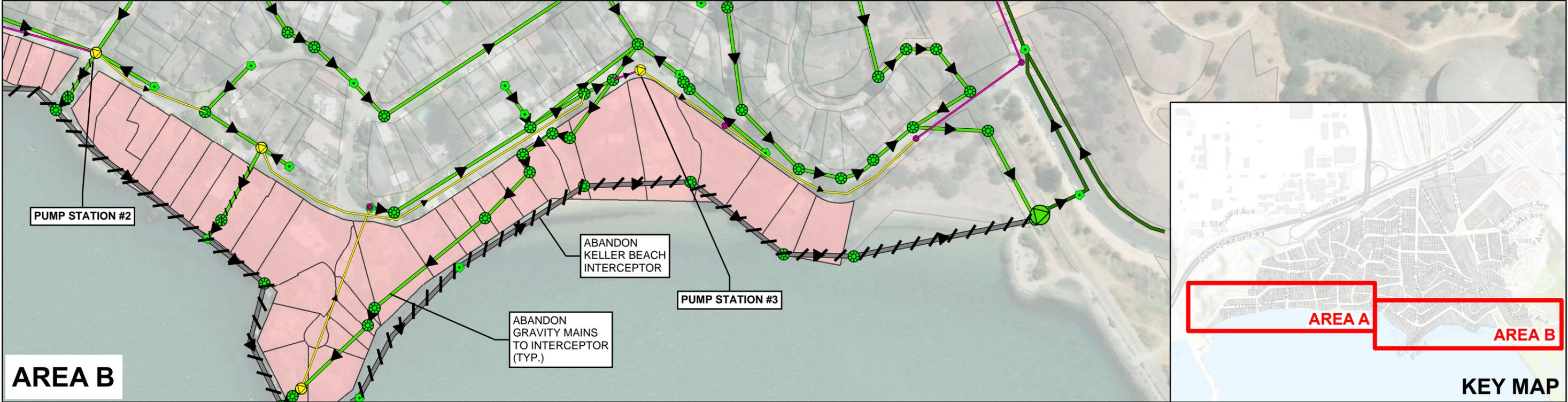
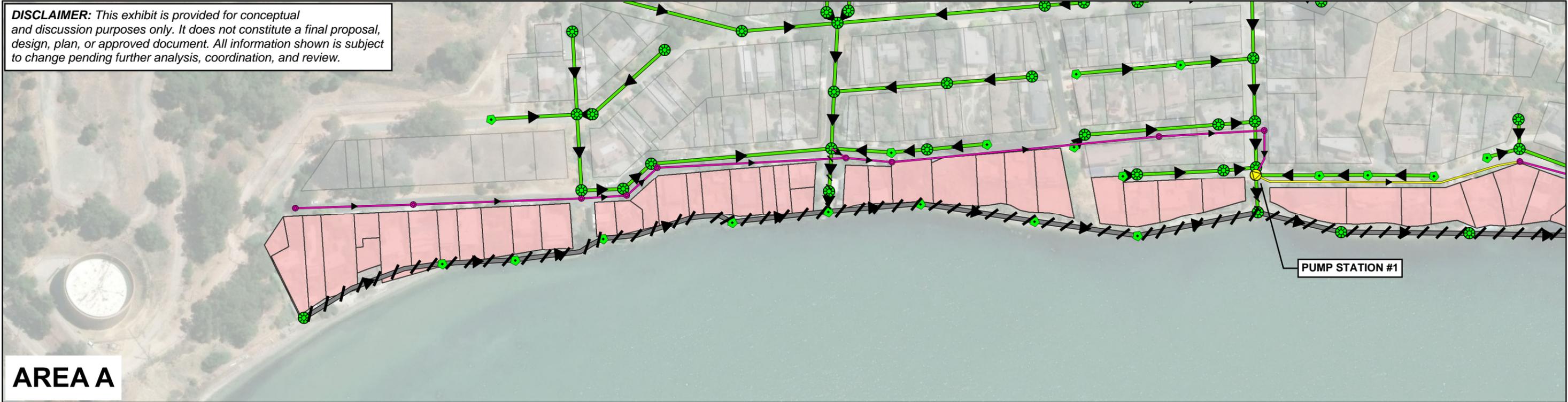
- New Pump Station
- New Manhole
- New Gravity Main
- New Force Main
- Parcel May Require Private Lift Station



SCALE: 1" = 200'



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**CITY OF RICHMOND
KBSS REALIGNMENT STUDY
C2 - INCLUDES TRENCHLESS;
REDUCES PUMP STATIONS**

- | EXISTING SEWER SYSTEM | PROPOSED SEWER SYSTEM |
|--------------------------|---|
| Pump Station | New Pump Station |
| Manhole | New Manhole |
| Lamphole | New Gravity Main |
| Keller Beach Interceptor | New Force Main |
| Gravity Main | Parcel May Require Private Lift Station |
| Force Main | |

NOTE: Ground elevations based on Google Earth. Invert elevations are approximated.

SCALE: 1" = 200'



DISCLAIMER: This exhibit is provided for conceptual and discussion purposes only. No analysis or review has been performed relative to topics such as (but not limited to) topography, geotechnical engineering, existing utility congestion, right-of-way mapping, permit requirements, or costs. It does not constitute a final proposal, design, plan, or approved document. All information shown is subject to change pending further analysis, coordination, and review.

KELLER BEACH SEWERSHED PARCELS: 350



**CITY OF RICHMOND
KBSS REALIGNMENT STUDY
EXISTING CONDITIONS**

EXISTING SEWER SYSTEM

- Pump Station
- Manhole
- Lamphole
- Keller Beach Interceptor
- Gravity Main
- Force Main

- Keller Beach Sewershed
- Parcel (Single-Family)
- Parcel (Multi-Family)
- Parcel (Open Space)
- Parcel (Undeveloped)
- Parcel (Not Part of Keller Beach Sewershed)
- Parcels Connected Directly to Keller Beach Interceptor

