

LEVEL 1
SANITARY SEWER STUDY
FOR
NEWBRIDGE SPECIFIC PLAN
COUNTY OF SACRAMENTO, CA
AUGUST 5, 2013

PREPARED FOR:
SACRAMENTO COUNTY
SACRAMENTO AREA SEWER DISTRICT
10545 ARMSTRONG AVENUE, SUITE 101
MATHER, CA 95655

PREPARED BY:
MACKAY & SOMPS CIVIL ENGINEERS, INC.
1552 EUREKA ROAD, SUITE 100
ROSEVILLE, CA 95661-2851

PROJECT DEVELOPER:
EAST SACRAMENTO RANCH, LLC
11350 KIEFER BOULEVARD
SACRAMENTO, CA 95830



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ABBREVIATIONS AND ACRONYMS

Ac	Acres
Ac-ft/Yr	acre-feet per year
Ac-ft/Yr/Ac	acre-feet per year per acre
AG	Agricultural Residential
Approx.	Approximately
AVD	Average day demand
BR	Bradshaw Interceptor
CAD	Computer Aided Design
EDU	Equivalent Dwelling Unit
FF	Fire Flow
Ft	Feet
Ft/s	Foot per second
Gpm	Gallons per minute
Hrs	Hours
M&S	MacKay & Somps
MDR	Medium Density Residential
MFR	Multi-family Residential
MG	Million gallons
Mgd	Million gallons per day
O.S.	Open space
POU	Place of Use
Project area	NewBridge project area shown in Exhibit A
Psi	Pounds per square inch
PVC	Polyvinyl Chloride
RD	Residential Development
SCWA	Sacramento County Water Agency
SFR	Single-family Residential
SOI	Sphere of Influence
Study area	East Planning Area as shown in Exhibit A
WSMP	Water Supply Master Plan
WTP	Water Treatment Plant
Zone 40	Zone 40 areas of Laguna, Elk Grove, Vineyard, Mather, Sunrise Corridor, Rio Del Oro, and Sunrise-Douglas.
Zone 41	Responsible party for operation and maintenance of the water supply facilities

EXECUTIVE SUMMARY

This Sacramento Area Sewer District (SASD) Level 1 Sanitary Sewer Study is prepared for the proposed NewBridge Specific Plan (the “Project”), a planned 1,095± acre mixed land use community in Eastern Sacramento County. NewBridge’s mix of land uses includes single-family and multi-family residential units, parks, open space areas and commercial/office land uses. Based on the February 25, 2009 Minimum Sewer Study Requirements, the detail in this study supports a Level One design analysis establishing a conceptual backbone trunk system, tributary sheds, location of a proposed sewer pump/lift station, and defines sewer capacity reservations, and interim and ultimate connections to planned SASD facilities.

The purpose of this study is to satisfy SASD Level One Minimum Sewer Study Requirements, which are summarized as follows:

- To ensure technical compliance with the latest SASD Master Plan
- To support EIR documentation and set the groundwork for the Project finance plan
- Demonstrate that it is possible to provide sewer service to the Project
- To confirm the capacity of existing and future trunk sewers that will serve the Project
- To define capacity reservations, establish sewer sheds, size the backbone and major internal trunk sewer systems, locate and approximate the size of a pump station, establish approximate depth of pipes and verify cover.

The focus of this study is on topography, major infrastructure phasing & timing, interceptor capacity, trunk sewer capacity, and shed shifts. The findings of this study indicate that the project can be served by SASD and SRCSD.

An interim shed shift was approved by SASD on December 13, 2011 to allow the project to sewer to the existing Bradshaw Interceptor via the proposed Mather East Trunk Sewer. The reason for this interim shed shift is that the downstream sewage facilities (Florin and Elder Creek Interceptor and associated trunk sewer systems) identified by SRCSD and SASD to provide sewer service for the Project area are not scheduled for completion by 2035 (or later). To the north, however, the 72” Bradshaw Interceptor (Section 7) has sufficient capacity to service the Project on a permanent basis.

While the interim shed shift does not require any new facilities or modifications to any existing facilities, upsizing of the upper portions of the planned Mather East Trunk Shed sewer facilities will be required. The upsizing of those facilities is analyzed and set forth in this Sewer Study.

In conclusion, there is sufficient capacity within the existing offsite interceptor system to accommodate the project. Onsite gravity collector and trunk sewer system can be constructed to convey sewer flow to a proposed interim pump station. Offsite facilities can be constructed to convey sewer flows from the pump station to the interceptor.

1. Introduction and Background

1.1 Project Location:

The Project is located in the eastern portion of Sacramento County and south of the existing Mather Field Specific Plan and proposed South Mather Specific Plan, south of Kiefer Boulevard, see **Exhibit A**.

The Project consists of a number of contiguous parcels that border Jackson Road to the south, Sunrise Boulevard to the East, on the west by the westerly boundary of a block of lands that lie westerly of Eagles Nest Road, and on the north by Kiefer Boulevard. North of Kiefer Boulevard is the proposed South Mather Specific Plan area and west of the Project is the proposed Jackson Township project. East of Sunrise Boulevard is the Sunrise-Douglas Community area which is located within the City of Rancho Cordova.

The property also lies within the Jackson Corridor Planning Area per the County's 2011 General Plan Update. **Exhibit A** shows the relationship of the Project to the proposed South Mather Specific Plan and Rancho Cordova City Limits.

1.2 Topography and Site Specific Design Considerations

The Project is described as flat to gently rolling terrain from a high of approximately 152 feet to a low of approximately 116 feet. The highest areas are located near the northeasterly area of the Project, where the rendering plant is currently located. The lowest area is in Frye Creek, a drainage swale that runs from the northeastern boundary of the site (near Sunrise and Kiefer Boulevards) to the southwestern boundary of the site (near Eagles Nest Road and Jackson Highway).

The majority of the Project sheet flows to this well defined swale referred to as Frye Creek. Frye Creek is a tributary of the Laguna Creek Shed. The southeastern portion of the Project drains to the south, and this shed is tributary to Laguna Creek. The Project's northwesterly quadrant drains to a tributary of Morrison Creek. Located in the northwest corner of the project is a relatively small shed that drains to the upper reach of Elder Creek. See **Exhibit B**.

1.3 Land Use and Zoning Current Land Use:

The Sacramento Rendering Company plant is located on parcel 067-0090-019. The remaining parcels within the Project are vacant and are currently used as pasture land for cattle and sheep, excepting therefrom a block of land located in the southwest portion of the Project area that consists of approximately four rural single-family residences along the western side of Eagles Nest Road. See **Exhibit B**.

Existing zoning and land use per assessor's information is as follows:

APN	Zoning	Land use	Acreeage (Approx.)
067-0050-048	M1	Extensive Industrial	198±
067-0080-013	AG 80	Ag., Dry Pasture	25±
067-0080-014	AG 80	Ag. Residential	5±
067-0080-015	AG 80	Ag. Residential	2±
067-0080-016	AG 80	Pet Cemetery	2±
067-0080-025	AG 80	Ag., Dry Pasture	13±
067-0080-029	AG 80	Cemetery	14±
067-0080-030	AG 80	Ag. Residential	2±
067-0080-037	AG 80	Ag. Residential	16±
067-0080-046	AG 80	Ag., Dry Pasture	1±
067-0080-047	AG 80	Ag. Residential	20±
067-0090-002	M2	Vacant, Ag.	22±
067-0090-005	M2	Vacant, Ag.	160±
067-0090-018	O	Folsom South Canal	45±
067-0090-019	M2	Light Industrial (Rendering Plant)	122±
067-0090-021	AG160	Ag., Dry Pasture	295±
067-0110-066	AG 80	Ag., Dry Pasture	5±
067-0110-067	AG 80	Highway	2±
067-0120-018	O	Folsom South Canal	12±
067-0120-059	Ag 20	AG., Dry Pasture	5±
067-0120-060	O	SMUD Sub-Station	1±
067-0120-066	AG 160	Highway	1±
067-0120-067	AG160	Ag., Dry Pasture	116±
		Total	1,095±

Note: Numbers may not add due to rounding.

1.4 Proposed Land Use:

The Project proposes a mix of uses including single and multi-family residential, neighborhood parks, commercial, office, mixed use, bike/trail system, school, open space, and open space preserves, and collector and arterial and local roads. The project will have a total of approximately 3,707 residential units, including 3,075 in the proposed NewBridge Specific Plan and an allowance for the 632 future residential units located in the ±105 acres of agricultural area west of Eagles Nest Road.

The improvements for the project will consist of the construction of roads, grading, and utilities. A preliminary grading study was prepared to establish future grades. Most local undulations in land will be graded into a uniformly graded landscape to assist in construction of buildings and residences. See **Exhibit C**.

The Project's proposed land use is as follows:

Land Use Description ^[1]	Corresponding Land Use Classification in Zone 40 WSMP	Total ^[3] Acres	Dwelling Units	ESD Factor ^[2] (ESD/Acre (DU))	Total ESD ^[3] Demand
Low Density Residential	Single Family	225.2		6.0	1,352
Medium Density Residential	Multi-Family Low Density	107.3	870	75%	654
High Density Residential	Multi-Family High Density	37.3	970	75%	729
Commercial Mixed Use	Mixed Use	11.7		6.0	71
Future Residential (LDR)	Single Family	105.4		6.0	633
Commercial	Commercial	19.2		6.0	116
Office	Office	14.0		6.0	84
Neighborhood Park	Public Recreation	41.3		6.0	248
Community Garden	Public Recreation	8.9		6.0	54
Open Space (Canal)	Vacant	58.9		0.0	0
Open Space (Multi-Use)	Vacant	28.5		6.0	171
Open Space (Landscape)	Public Recreation	44.4		6.0	267
Preserve	Vacant	331.0		0.0	0
Elementary School	Public Recreation	9.4		6.0	57
Fire Station	Public	2.5		6.0	15
Major Roads	Vacant	50.0		0.0	0
SMUD Electric Site	Utility	0.3		0.0	0
Total		1,095±			4,463

Note:

[1] Land Use provided by MacKay & Soms, based on April 11, 2013 Land Use Plan

[2] SASD equivalent sewer demand factors; 75% for Multi-Family Residential Units.

[3] Numbers may not add due to rounding.

1.5 Sewer Sheds and Facilities to Serve the Project:

The Project lies within the sphere of influence for Sacramento Area Sewer District, (SASD) and Sacramento Regional County Sanitation District (SRCSD). In order to receive public sewer service, the proposed plan area will require annexation to both districts.

Based on the SASD 2010 Sewer System Capacity Plan (SSCP), the Project is located within three (3) SASD trunk sheds (see **Exhibit D**):

1. BR Mather East,
2. BR Elder Creek, and
3. BR Florin.

The BR Mather East shed portion within the project totals 33 acres. This shed area is tributary to the proposed BR Mather East Trunk Sewer that is planned to convey flows along the future alignment of Eagles Nest Road northerly to Zinfandel Drive and ultimately to the existing Bradshaw Interceptor at Manhole N38-MH0147A.

The BR Elder Creek shed within the Project area totals 198± acres, all of which is proposed as a wetland preserve – no development will occur in this sewer shed area. This shed area is tributary to the future BR Elder Creek Trunk Sewer at Node 310-206-EN001. This trunk sewer is planned to convey flows southerly and westerly to the future Elder Creek Interceptor.

The BR Florin shed within the project area totals 897± acres, of which 622± acres are developable. The remaining 275± acres of this shed will get dedicated as open space preserve, not requiring sewer facilities. This shed area is tributary to the future Eagles Nest Road Trunk Sewer at Jackson Road (Node 308-209-EN001) which will convey the flows southerly along Eagles Nest Road to a point of connection with the future Florin Interceptor at Node 302-209-INT002.

The SRCSD Interceptor Sequencing Study 2013 (ISS) indicates that the Florin and Elder Creek Interceptors are not planned to be constructed until 2035 and 2038, respectively. Since the majority of the developable area within the Project is located within the BR Florin shed, the timing of the construction of the Florin Interceptor presents a unique challenge.

Notwithstanding the interceptor service area plans set forth in the ISS, the development of the Mather East and NewBridge sewer sheds will, in all likelihood, be completed long before the planned construction of the Florin Interceptor in 2035. Accordingly, this necessitates the need for the previously approved interim shed shift of the BR Florin portions of the project area to flow northerly to the BR Mather East Trunk Sewer via a pump station and force main. Additionally, the planned sizes of the proposed BR Mather East Truck Sewer may require upsizing to accommodate these additional flows.

Eventually, long beyond the planning horizon of this sewer study, there will be an opportunity to abandon this planned pump station and force main. At that time, the Project area could connect to the future Eagles Nest Trunk Sewer and the future Florin Interceptor.

On February 18, 2010, SASD approved a Level 2 master sewer study that addressed trunk sewer relief for South Mather Development area. As stated in that study, NewBridge has the potential to add sewer flows on an interim basis to the MA Mather Kiefer trunk shed by way of the MAE gravity sewer trunk (now known as the BR Mather East Trunk Sewer) proposed in the extension of Zinfandel Dr / Eagles Nest Road.

The proposed BR Mather East Truck Sewer is the closest point to which the Project's may discharge to a gravity trunk system. Downstream, the BR Mather East Trunk Sewer will discharge into Section 7 of the Bradshaw Interceptor located at the intersection of Zinfandel Dr / North Mather Blvd. The Bradshaw Interceptor has sufficient capacity to service the Project on an interim basis. Portions of the proposed BR Mather East Trunk Sewer may need to be upsized to handle the flows generated within the project.

Total developable area of the Project equals 655± acres. Note these total developable sewer shed areas includes adjacent roadways. Refer to **Exhibit E**.

Build-out of NewBridge will generate approximately 3.23 MGD of wastewater. On-site trunk and collector gravity lines would collect the effluent from the Project and convey it to a proposed pump station located approximately at the midpoint in the southern portion of the project, at which point dual force mains (6" and 10") will convey wastewater flows to one of the approved alternatives listed below. Due to the need for sanitary sewer service prior to SASD and SRCSD timetables, the Project previously obtained an interim shed shift using a pump station and force mains labeled "Preferred Alternative" below. Also, two additional alternatives are described below:

Preferred Alternative:

The Project's preferred alternative proposes to construct a sewer force main from the Project's proposed pump station heading west over to Eagles Nest Road. The force main will then proceed north along Eagles Nest Road exiting the Project at the intersection of Kiefer Boulevard / Eagles Nest Road. At this location the force main will terminate and discharge into the upstream manhole of the MAE gravity trunk sewer line.

The MAE sewer line aligned in Eagles Nest Road will pass under a drainage tributary of Morrison Creek approximately 700 feet from the intersection and continue north where it will connect up with the Bradshaw Interceptor located at the intersection of Zinfandel Drive / North Mather Blvd. Approximately 9,550 linear feet of dual force mains, (10" & 6") and approximately 17,250 total linear feet of gravity trunk sewer (MAE trunk sewer) will be required.

In-addition to providing the Project's sewer service, the proposed MAE gravity sewer trunk line will serve the South Mather Specific Plan as an ultimate facility. It is anticipated that future planning areas of Mather Field would share in the cost of constructing the gravity trunk sewer line.

In the event the MAE gravity sewer trunk line improvements have not been completed when the NewBridge project is ready to begin construction, then the force mains will be extended North, on an interim basis, to the Bradshaw interceptor located at Zinfandel. When the gravity line is built the Force Mains will be connected to the upstream limit of the gravity system thereby reducing the length of the Force Mains and the energy requirements of the pumping station.

Alternative A:

This alternative proposes to construct a sewer force main from the Project's proposed pump station heading west over to Eagles Nest Road. The force main will then proceed north up to the intersection of Eagles Nest Road / Kiefer Boulevard at which point it would continue west along Kiefer Boulevard to the Bradshaw Interceptor at Happy Lane, totaling approximately 30,000 linear feet of force main. This alignment will parallel the existing Anatolia SASD facilities that generally follow the alignment of Kiefer Boulevard west of Eagles Nest Road.

Alternative B:

This alternative includes the pump station and a sewer force main from the project site extending west along Jackson Road discharging into the Bradshaw Interceptor at Bradshaw Road, approximately 24,700 total linear feet.

Exhibit F shows the Preferred Alternative, Alternative A, and Alternative B layouts.

2. Concept Design

2.1 General Design Concepts

Downstream Capacity Assumption: Based on the results of the ISS it is understood that the Bradshaw Interceptor has adequate capacity to serve the Project on a permanent basis.

On-site & off-site land use ESD density for flow calculations: For this level of study, 6 ESDs per acre were used for flow calculations. Future SASD Level Two Sewer Study will need to be done prior to approval of any tentative subdivision maps which will identify a refined ESD count based and flows per district standards.

2.2 Level of Study and Background

This study identifies a Point of Connection (POC), locates a pump station, and calculates sewer system requirements to serve the Project based on:

- SASD Design Standards Version 2.00, dated February 25, 2009
- The Project's proposed land use plan with acreages and densities
- Project phasing and timing
- An approved interim shed shift from the BR Florin Truck Sewer Shed to the BR Mather East Trunk Sewer Shed

Based on SASD Minimum Sewer Study Requirements dated February 25, 2009, this study provides information to establish the project backbone trunk system and sewer lift/pump station. Sewer sheds, total ESDs at nodes, and flow rates, have been calculated to provide Level One detail. **Future Level II sewer study will be required prior to approval of any tentative subdivision maps.**

2.3 Approach and Criteria

Task One: Compile Record Data

The design approach for the Project Sewer Study began with compilation of known data and resources, previously prepared studies, and the layout and land use summary with densities proposed for NewBridge including the following:

- SASD Design Standards Version 2.00, dated February 25, 2009
- 2010 Sewer System Capacity Plan (SASD)
- 2013 Interceptor Sequencing Study (SRCSD)
- The best available topography information for the project site and the upstream shed to the north
- Land use plan with acreages and densities for the Project

Task Two: Obtain Criteria to Calculate ESDs and Design Flows

This study uses design criteria from the SASD Design Standards Version 2.00, dated February 25, 2009. The following tables are a summary of ESD data, formulas used to calculate average dry weather and peak wet weather flows, and design/capacity criteria to size pipelines:

Table 1 ~ Design Flow Factors

Item	Value
ESD Flow Factor ~ PDWF	310 GPD per ESD
Inflow – Rainfall Dependent ~ 10-year storm	1000 GPD / acre
Groundwater ~ new development (5yrs & younger)	400 GPD / acre
Groundwater ~ old development	600 GPD / acre

Source: SASD Design Standards Version 2.00, dated February 25, 2009

Table 2 ~ Design Flow Formulas

Collector and Trunk Sewers	Formula or Value
ESDs	Number of equivalent residential dwelling units
ADWF =	$(\text{ESDs} \times 310) \div 1,000,000$
Rainfall Dependent I / I	1,000 gal/ac/day
Groundwater infiltration (GWI)	400 gal/ac/day ~ new development
Total I / I plus GWI =	$(1,000 + 400) \times \text{ac of sewer shed area}$
Peaking Factor (PF) =	$3.5 - (1.8 \times \text{ADWF}^{0.05})$, Minimum is 1.2
PDWF (mgd) =	$\text{ADWF} \times \text{PF}$
PWWF (mgd) =	$\text{PDWF} + Q_{II}$

Source: SASD Design Standards Version 2.00, dated February 25, 2009

Table 3 ~ Hydraulic Design Criteria

Collector and Trunk Sewer	Value
Manning "n"	0.013
Minimum Velocity at PWWF	2.0 fps
Maximum Velocity	8.0 fps
Maximum d/D ~ diameter < 12"	0.7
Maximum d/D ~diameter = or > 12"	1.0

Source: SASD Design Standards Version 2.00, dated February 25, 2009

Table 4 ~ Minimum Pipe Slope & Velocities

Collector and Trunk Sewer				
Pipe Diameter	Minimum Slope	Fixed	Minimum Schematic Slope	d/D
8"	0.0035		0.0060	0.7
10"	0.0025		0.0035	0.7
12"	0.0020		0.0024	1.0
15"	0.0015		0.0018	1.0
18"	0.0012		0.0014	1.0
21"	0.0011		0.0012	1.0

Source: SASD Design Standards Version 2.00, dated February 25, 2009

Note: Slopes indicated are based on a minimum velocity of 2fps.

Task Three: Calculate ESDs and Peak Flows Using SASD Standards

- A preliminary grading study was prepared to set grades. This study generally followed the “lay of the land”.
- Concurrent with setting preliminary grades, sanitary sewer trunk grades were established to meet minimum cover for sewers of five feet and minimum depth of 6.3 feet. The POC downstream was identified to serve the future sewer shed. The proposed land plan is the basis of the schematic layout for the projection of sewer pipes and slopes, so that serviceability can be verified. See **Exhibit G**.
- From the Project’s land use plan, identify land uses and densities, and calculate the project ESDs. Consistent with SASD Standards, parks, open space, and arterial roads will be assigned an ESD count of 6 ESDs per acre, unless they are proposed to be dedicated and conveyed conservation parcels or easements in which case they will be assigned an ESD count of 0 ESD’s per acre. From the ESD counts, calculate PWWFs to compare the design flow to the available capacity at POC.

3. Preliminary Study Results and Summary of Flows

3.1 Recap of SASD Study Requirements and Results

At the beginning of this study, a description of SASD Minimum Sewer Study Requirements for a Level One report included:

- Ensure technical compliance with the latest SASD Master Plan.
- Confirm the capacity of existing and future trunk sewers that will serve the Project.
- Establish sewer sheds and size the backbone and internal trunk sewer systems, locate and size pump stations. The study focus is on the interceptor and trunk sewers and their capacity, shed shifts, defining sewer capacity reservations and exceptions to policy needed for approval.

This study achieves the SASD requirements and has:

- Identified the Project POC, established pump station location, and available capacity.
- Identified upstream tributary sewer shed area and sized the Trunk sewer system to accept future development based on current SASD design criteria.
- Calculated wastewater flows using proposed project land uses, areas, ESD unit counts, and upstream shed areas based on current SASD design criteria.
- Used the project layout, schematic sewer line design, and grades to confirm that minimum cover is available on all project collector and trunk sewer systems.
- Used project sewer flows to locate and size sewer pump station.

Results of this study are shown on maps and tables included in this study.

3.2 Summary of Wastewater Flows:

Using SASD design criteria for base ESD flow rates times peaking factor, plus groundwater infiltration (GWI), and rainfall dependent inflow and infiltration (RDI/I), the project peak wet weather flows, PWWF (mgd), are calculated.

See **Exhibit H**

4. Interim Shed Shift

The Project previously obtained an interim shed shift for approximately 1,062 acres, and a total of 4,263 ESD's from the BR Florin Trunk Shed to the BR Mather East Trunk Shed. The reason for this proposed interim shed shift was explained above. According to the ISS and SSCP, the existing 72" Bradshaw Interceptor (Section 7) has sufficient capacity to service the Project. The proposed interim shed shift does not require any new, or modifications to any existing permanent, facilities. Upsizing of the planned BR Mather East Truck Sewer will be required.

Table H summarizes the Project's proposed interim shed shift (based on proposed developable area) to move sewer trunk sheds from BR Florin Trunk Shed to the BR Mather East Trunk Sewer Shed.

See **Appendix A** for the approved SASD Master Plan Trunk Interim Shed Shift. Also included is the approval letter.

5. Design Deviation Request

We have requested a design deviation to allow us to remove the open space preserve areas within the Newbridge Specific Plan from the ESP calculations. This has allowed us to model the approximate flows, the force main and the pump station sizing without upsizing for the added ESP's that will never exist as the preserve area will never be developed. Also, the estimating of the costs of the facilities has a higher degree of accuracy.

See **Appendix B** for the Design Deviation Request.

6. Summary / Conclusion:

The summary of the findings of this sewer study are outlined below:

- It was determined that the previously approved interim sewer shed shift would allow gravity service to the entire project since the Florin and Elder creek interceptors will not be constructed until approximately 2035.
- A 3.23 mgd (2,243 gal per minute pump) sewer pump station will be required to serve the proposed project area. The sewer pump station will be located near the mid-point of the Project's southern boundary.
- While the preferred alternative is to utilize the MAE trunk sewer, it's not the only option available to sewer the project. Alternatives A & B are feasible (but more costly) alternatives if the MAE trunk sewer option is not available at the time of development.
- A SASD Level Two study will need to be done prior to approval of tentative subdivision maps.

In conclusion, there is sufficient capacity within the existing offsite interceptor system to accommodate the project. Onsite gravity collector and trunk sewer system can be constructed to convey sewer flow to a proposed pump station. Offsite facilities can be constructed to convey sewer flows from the pump station to the Bradshaw Interceptor via the proposed BR Mather East Trunk Sewer, or the utilization of Alternative A or B described above.

APPENDIX A

SASD MASTER PLAN TRUNK INTERIM APPROVED SHED SHIFT APPROVAL INCLUDING APPROVAL LETTER

SACRAMENTO AREA
SEWER DISTRICT
SERVING YOU 24/7

December 13, 2011
E225.000

Ken Giberson
MacKay & Soms
1552 Eureka Road, Suite 100
Roseville, CA 95661

**Subject: Shed Shift Request for 'Newbridge – SASD Master Plan
trunk Interim Shed Shift Request' Approval**

Board of Directors
Representing:

County of Sacramento
City of Citrus Heights
City of Elk Grove
City of Folsom
City of Rancho Cordova
City of Sacramento

Dear Mr. Giberson:

Sacramento Area Sewer District staff reviewed the November, 2011
submittal of the Interim Shed Shift Request for 'Newbridge' and finds it
sufficiently addresses comments, and is considered approved. .

A sewer study associated with this project has been submitted and is in the
review stages. If you have any questions regarding these comments, please
call myself at 916-876-6296.

Stan Dean
District Engineer

Christoph Dobson
Director of Operations

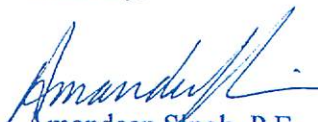
Prabhakar Somavarapu
Director of Policy & Planning

Karen Stoyanowski
Director of Internal Services

Joseph Maestretti
Chief Financial Officer

Claudia Goss
Public Affairs Manager

Sincerely,


Amandeep Singh, P.E.
Sacramento Area Sewer
District
Development Services

AS:kmf

cc: SRCSD Development Services
Capacity Management

10060 Goethe Road
Sacramento, CA 95827-3553
Tel 916.876.6000
Fax 916.876.6160
www.sacsewer.com



November 1, 2011

Mr. Salam Khan, P.E.
Sacramento Area Sewer District (SASD)
10545 Armstrong Avenue
Mather, CA 95655

Re: Newbridge - SASD Master Plan Trunk Interim Shed Shift Request

Dear Salam:

Enclosed is a formal request to approve a 631.8 acre Interim Shed Shift from the LC Eagles Nest Trunk Shed (LCG & LCH) to the MA Mather Kiefer Trunk Shed. A brief description of this request is as follows:

Interim shift: 631.8 acres / 3790 ESD's from the LC Eagles Nest Trunk Shed (LCG & LCH) to the MA Mather Kiefer Trunk Shed.

Reason: South of Newbridge, the downstream sewage facilities, (Laguna Creek Interceptor and trunk sewer systems) identified by SRCSD and SASD to provide sewer relief for this area (including portions of the surrounding region) are scheduled for completion by 2022 (or later). To the north exists the 72" Bradshaw Interceptor (Section 7). There is sufficient capacity in this Bradshaw Interceptor to service the Project on an interim basis until such time as the Laguna Creek Interceptor and trunk sewer systems (or other similar facilities) are completed. This interim shed shift request does not require any new or modifications to any existing or permanent facilities.

The following table summarizes Newbridge's proposed interim shed shift (based on proposed developable area) to move sewer trunk sheds from LC Eagles Nest Trunk Shed (LCG & LCH) to the MA Mather Kiefer Trunk Shed on an interim basis.

Sewer Shed	Area (acres)	ESD's	PWWF (mgd)
LCG110	56.5	339	0.28
LCH050	176.7	1060	1.10
LCG090	148.4	890	1.76
LCH040	120.4	722	0.58
LCH020	45.5	273	0.23
LCG080	84.3	506	0.41
Subtotals	631.8	3790	N/A

The following table summarizes the LC Eagles Nest Trunk Shed (LCG & LCH) as presented in SASD 2006 Master Plan Update. This table will be superseded with the Newbridge proposed interim shed shift table, as presented on page 1.

Sewer Shed	Area (acres)	ESD's	PWWF (mgd)
LCG110	160.0	960	0.76
LCH050	207.2	1243	1.70
LCG090	166.7	1000	2.44
LCH040	144.9	870	0.69
LCH020	77.3	464	0.38
LCG080	133.2	799	0.64
Subtotals	889.3	5336	N/A

Duration: Until such time that SASD’s planned downstream trunk facilities and SRCSD’s planned Laguna Creek Interceptor are completed, these shed shifts will remain on an interim basis. As noted in SRCSD Interceptor Master Plan 2000, the Laguna Creek Interceptor is not scheduled for completion until 2022, and with the current down economy and economic uncertainties it may very likely be beyond 2022.

Cost: The proposed trunk sewer interim shed shift will affect infrastructure cost by approximately:

Item #	Quantity	Unit	Description	Unit Price	Amount
1	8,750	LF	10” Sanitary Sewer Force Main, PVC	\$60.00	\$525,000
2	1	EA	Connect to Trunk Sewer	\$10,000.00	\$10,000
3	lump sum	LS	Sewer Lift Station (2.87 mgd)	\$2,870,000.00	\$2,870,000
Subtotal					\$3,405,000
Mobilization (5%)					\$270,250
Construction contingency (20%)					\$681,000
Engineering, Permits, Inspection (25%)					\$851,250
Grand Total					\$5,207,500

Notes:

1. Unit price of sanitary sewer force main includes all appurtenances.
2. Lift Station size based on net acres as reported in the Level 1 Newbridge Sewer Study.

This cost increase to the MAE shed is the result of an interim service solution if the Laguna Creek Interceptor is not constructed. Newbridge's interim service includes 8,750 linear feet of 10 inch sewer force main, and a 2.87 mgd Sewer Lift Station. The Sewer Lift Station will be located approximately at the midpoint of the Project's south area, where it will pump wastewater north to the upper reach of the gravity sewer trunk main as proposed in the approved Level 2 Master Sewer Study for the South Mather Development. As proposed in the South Mather Development's Master Sewer Study, the gravity sewer trunk line will precede north approximately 17,250 along Eagles Nest Road where it will connect to the existing 72" Bradshaw Interceptor located at the Zinfandel Drive Extension.

Attached to this Interim Shed Shift Request is the revised MA Mather Kiefer Trunk Shed Map, including supporting documents. Please review this request with the attached documents for approval of this interim shed shift to the SASD Master Plan. Contact me if you have any questions.

Respectfully,

Ken Giberson



Capacity Plan Interim Shed Shift Request Form

Expansion Area

Relief Area Note: (Capacity Plan does not have cost estimates or plan & profiles)

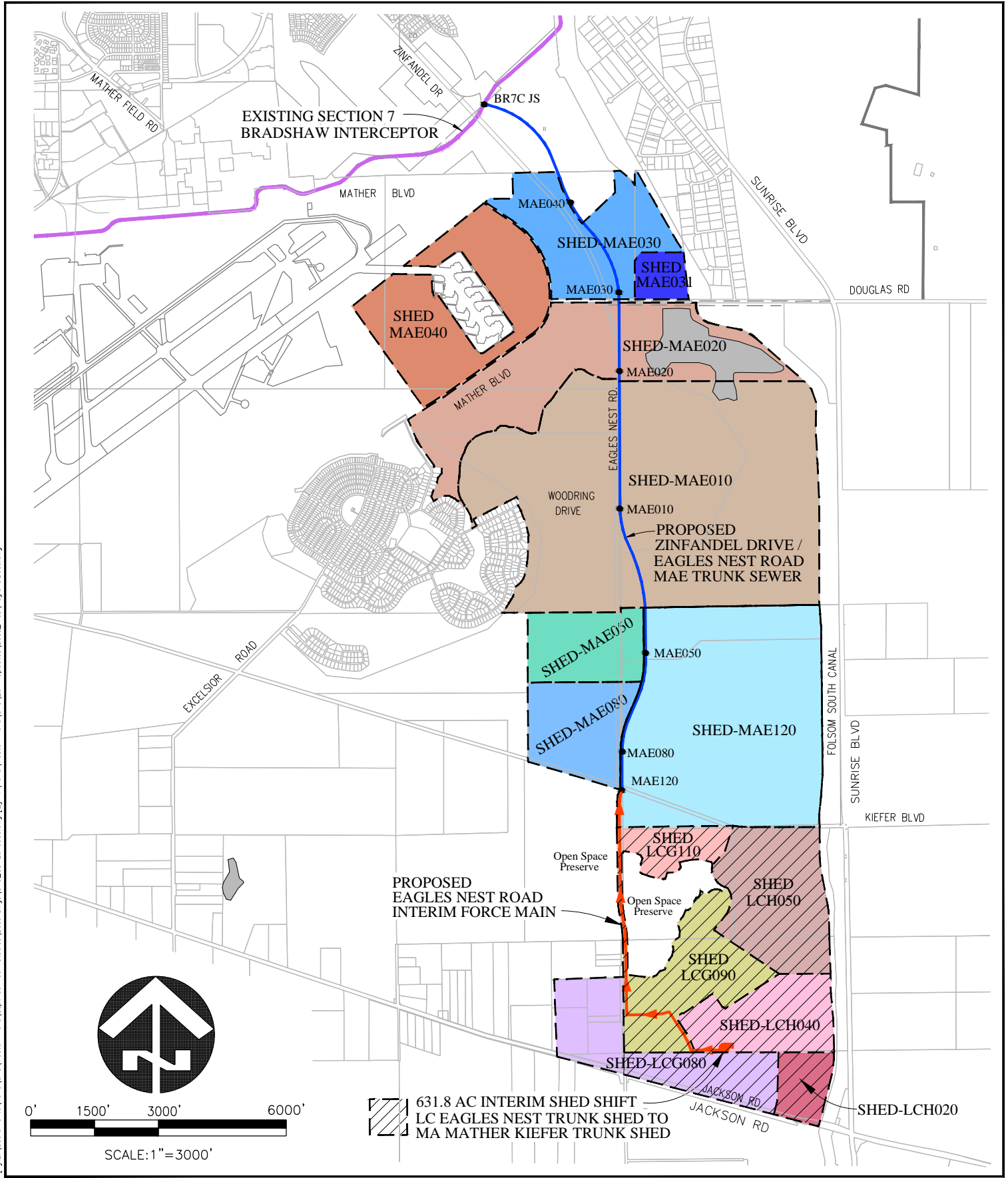
*Originator: MacKay & Somps	Date: November 01, 2011
-----------------------------	-------------------------

Requested change: (Duration of interim connection, interim connection point)
Interim Shed Shift of 631.8 acres from LC Eagles Nest Trunk Sheds: LCG080 (portion), LCG090, LCG110, LCH020, LCH040 and LCH050. These sheds will discharge to the upper reach of the proposed gravity sewer trunk line proposed for MA Mather Kiefer Trunk Shed (MAE) located in Eagles Nest Road as described in the approved Level 2 Master Sewer Study for South Mather Development. This gravity trunk sewer line outfalls to Section 7 of the 72" Bradshaw Interceptor.
Describe related facilities and the duration: (Pump station, storage tank force main, trunks, etc.)
The impacted facilities are the LCH trunk, LCG trunk, Laguna Creek Interceptor, MAE trunk and the Bradshaw Interceptor. All facilities proposed within the NewBridge development have been sized to accommodate the requested shed shift

Reason for change:
SASD and SRCSD downstream sewage facilities (gravity truck sewer lines and Laguna Creek Interceptor), identified to provide sewer relief for this area, and portions of the surrounding region, are not scheduled for completion until 2022, or later.
List of Trunk Sheds Impacted:
LC Eagles Nest Trunk Sheds: LCH020, LCH040, LCH050, LCG080, LCG090 & LCG110
Summary of Total Cost Impact to District, Total change in PWWF, Acreage, ESDs:
LC Eagles Nest Trunk LCG080: 84.3 ac, 507 esd, 0.41 mgd (PWWF)
LC Eagles Nest Trunk LCG090: 148.4 ac, 890 esd, 1.76 mgd (PWWF)
LC Eagles Nest Trunk LCG110: 56.5 ac, 339 esd, 0.28 mgd (PWWF)
LC Eagles Nest Trunk LCH020: 45.5 ac, 273 esd, 0.23 mgd (PWWF)
LC Eagles Nest Trunk LCH040: 120.4 ac, 722 esd, 0.58 mgd (PWWF)
LC Eagles Nest Trunk LCH050: 176.7 ac, 1060 esd, 1.10 mgd (PWWF)
Total Cost of Interim Sewer Facilities = \$5,207,500 (for detailed cost estimate, see page 2 of the attached cover letter).

* Originator completes this side of the form.

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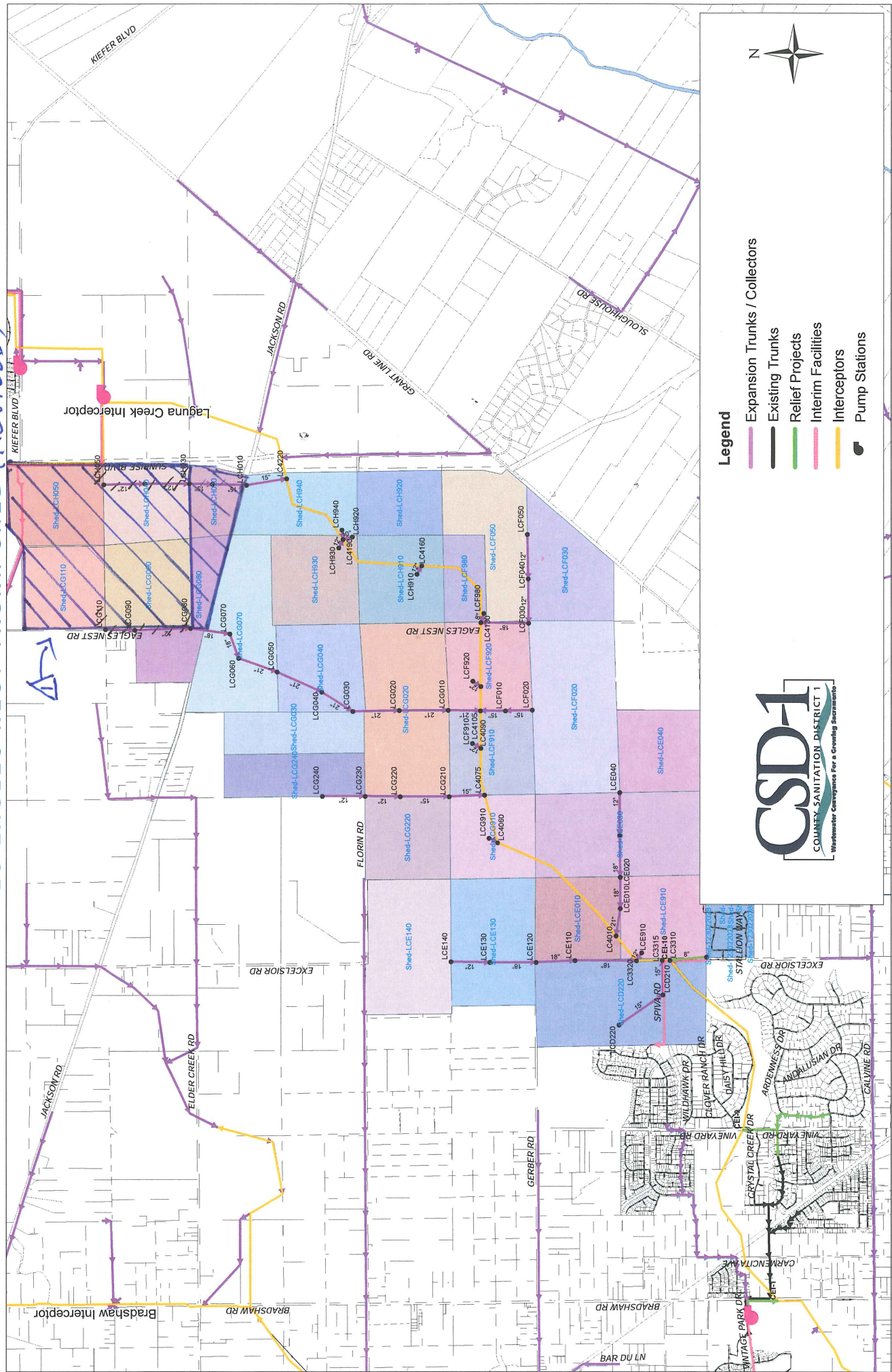
NEWBRIDGE

Interim Sewer Shed Shift

SACRAMENTO COUNTY, CALIFORNIA

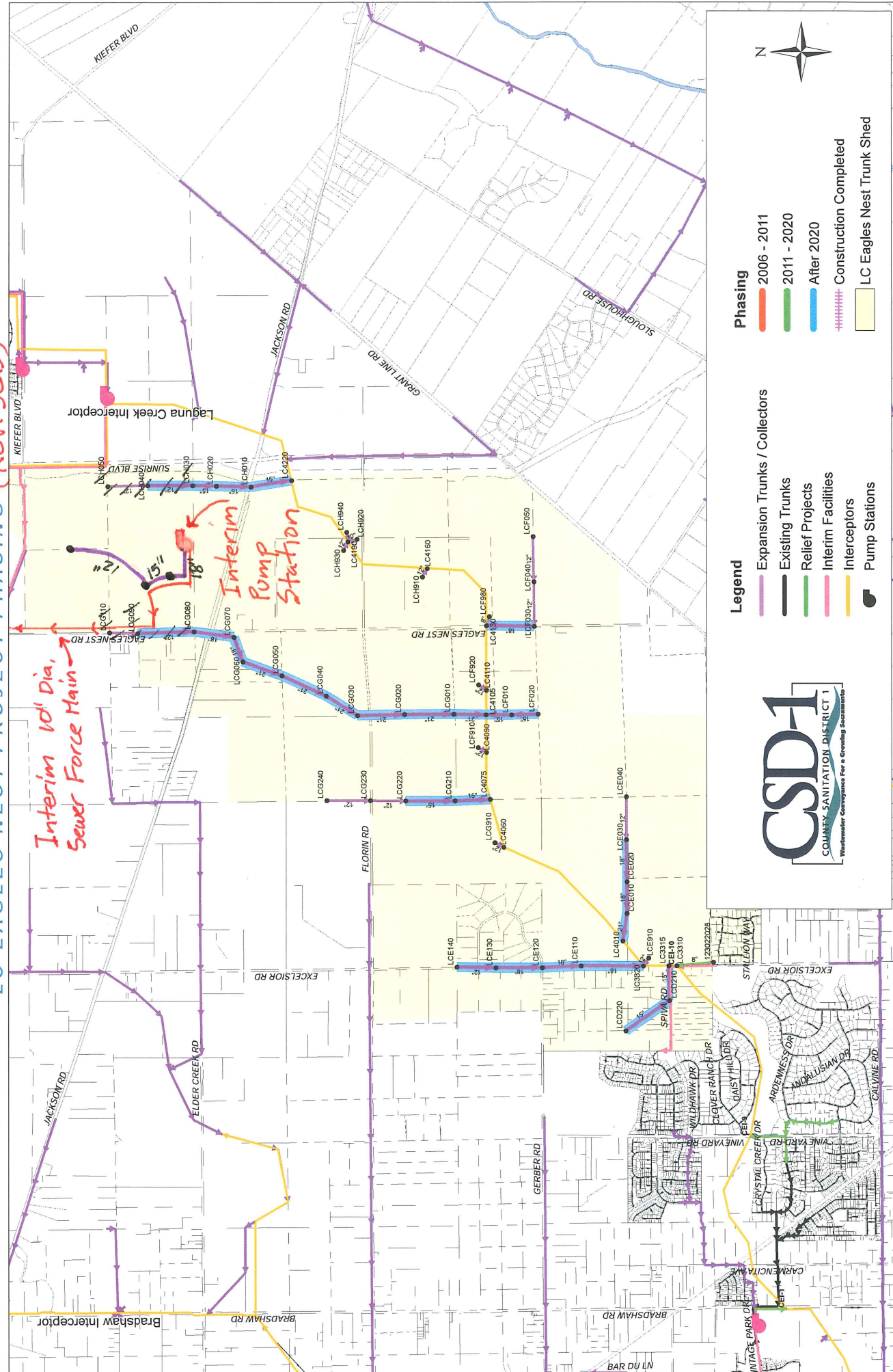
MACKEY & SOMPS
 ENGINEERS PLANNERS SURVEYORS
 November, 2011

LC EAGLES NEST TRUNK SHED (REVISED)




△ Interim Shed Shift by Newbridge, Sheds; LCH020, LCG080 (portion), LCG090, LCG110, LCH040, & LCH050 to MA Mather Kiefer Trunk Shed

LC EAGLES NEST PROJECT PHASING (REVISED)



Interim 10" Dia. Sewer Force Main

Interim Pump Station




Phasing

- 2006 - 2011
- 2011 - 2020
- After 2020
- - - - - Construction Completed
- LC Eagles Nest Trunk Shed

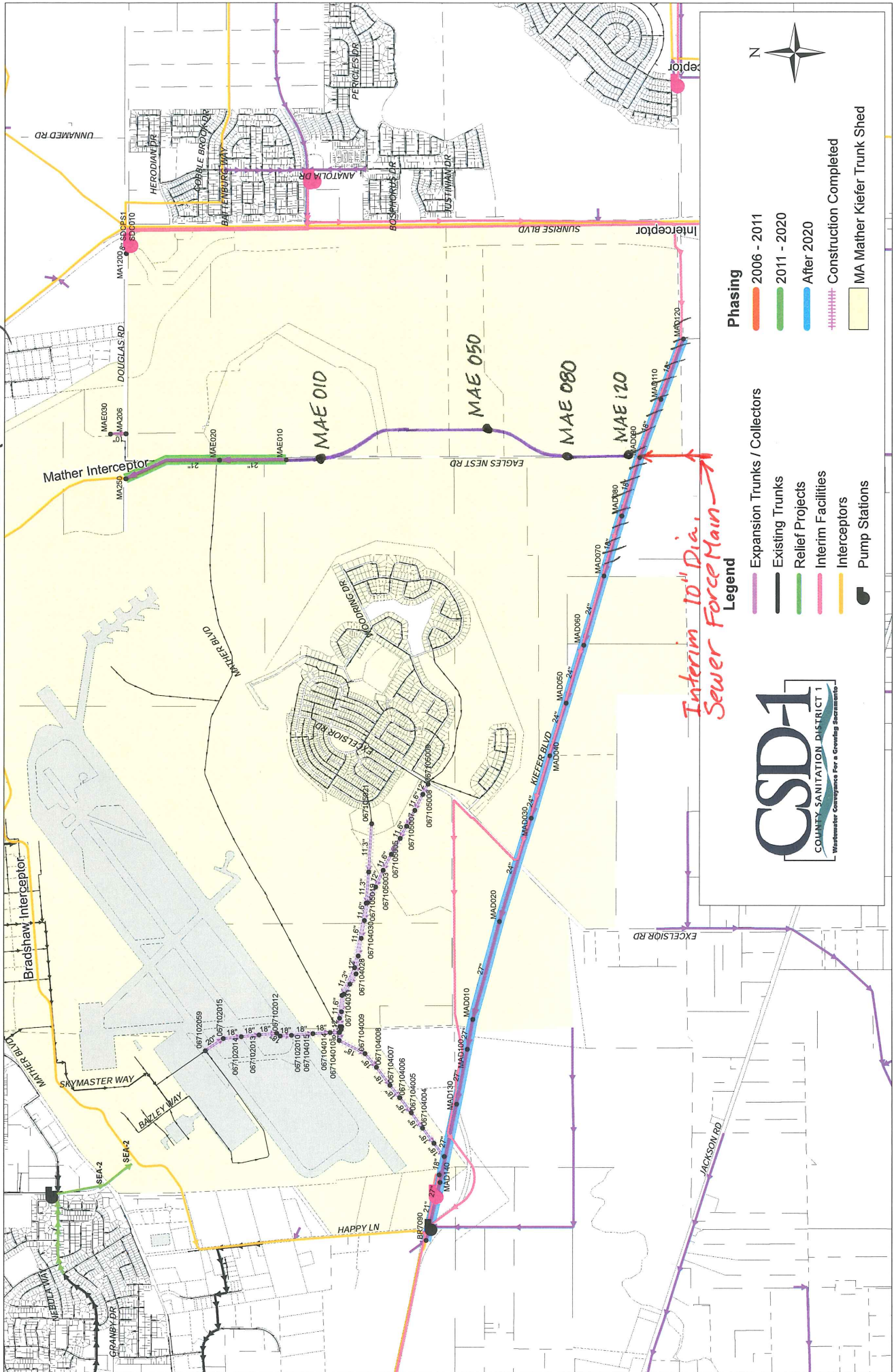
Legend

- Expansion Trunks / Collectors
- Existing Trunks
- Relief Projects
- Interim Facilities
- Interceptors
- Pump Stations



CSD-1
COUNTY SANITATION DISTRICT 1
Wastewater Compliance For a Growing Sacramento

MA MATHER KIEFER PROJECT PHASING (REVISED)



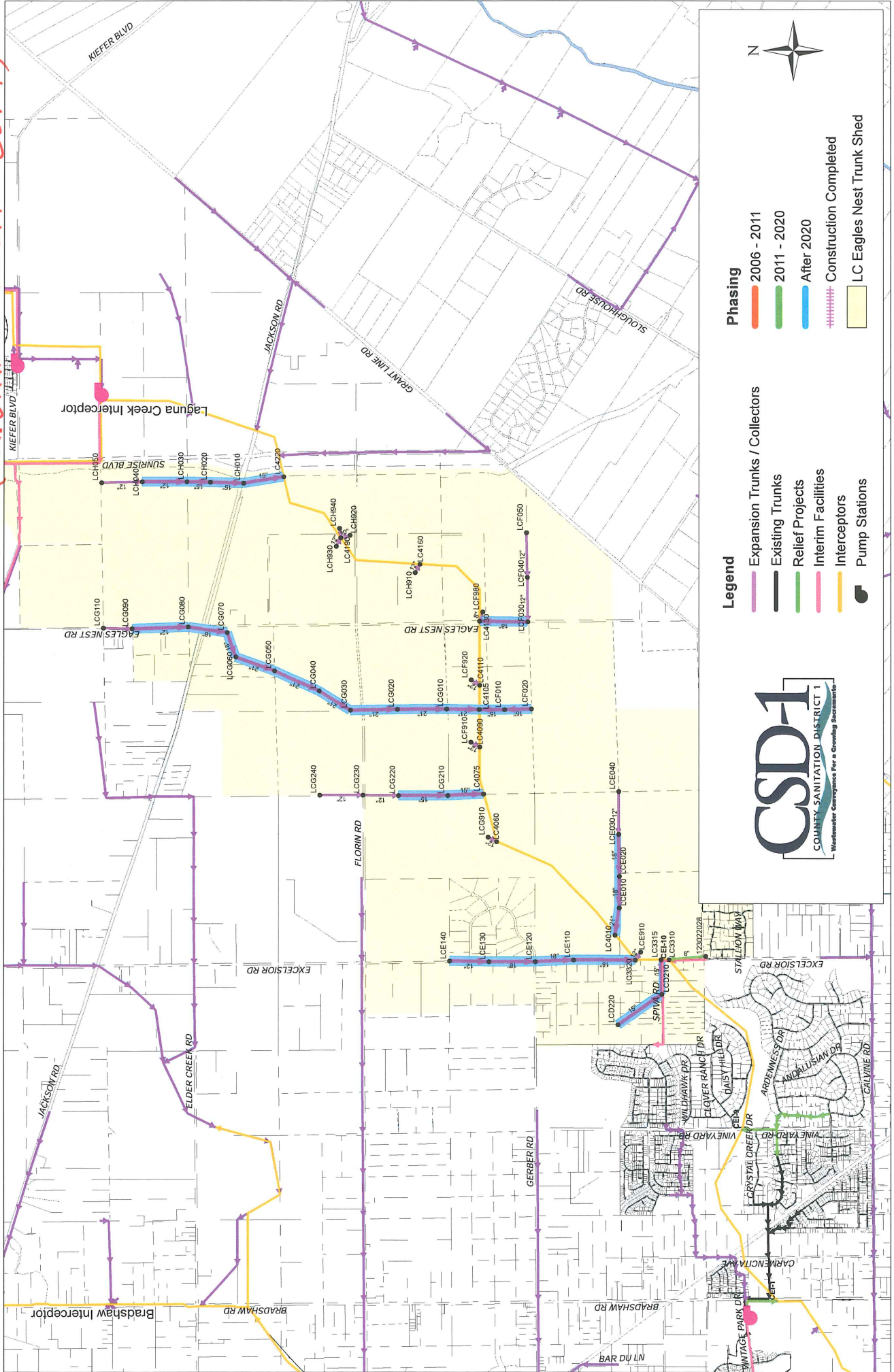
- Phasing**
- █ 2006 - 2011
 - █ 2011 - 2020
 - █ After 2020
 - █ Construction Completed
 - MA Mather Kiefer Trunk Shed

- Legend**
- Expansion Trunks / Collectors
 - Existing Trunks
 - Relief Projects
 - Interim Facilities
 - Interceptors
 - Pump Stations



Interim 10" Dia. Sewer Force Main

LC EAGLES NEST PROJECT PHASING (ORIGINAL CLEAN COPY)



- Phasing**
- 2006 - 2011
 - 2011 - 2020
 - After 2020
 - Construction Completed
 - LC Eagles Nest Trunk Shed

- Legend**
- Expansion Trunks / Collectors
 - Existing Trunks
 - Relief Projects
 - Interim Facilities
 - Interceptors
 - Pump Stations



MA MATHER KIEFER TRUNK SHED (ORIGINAL CLEAN COPY)

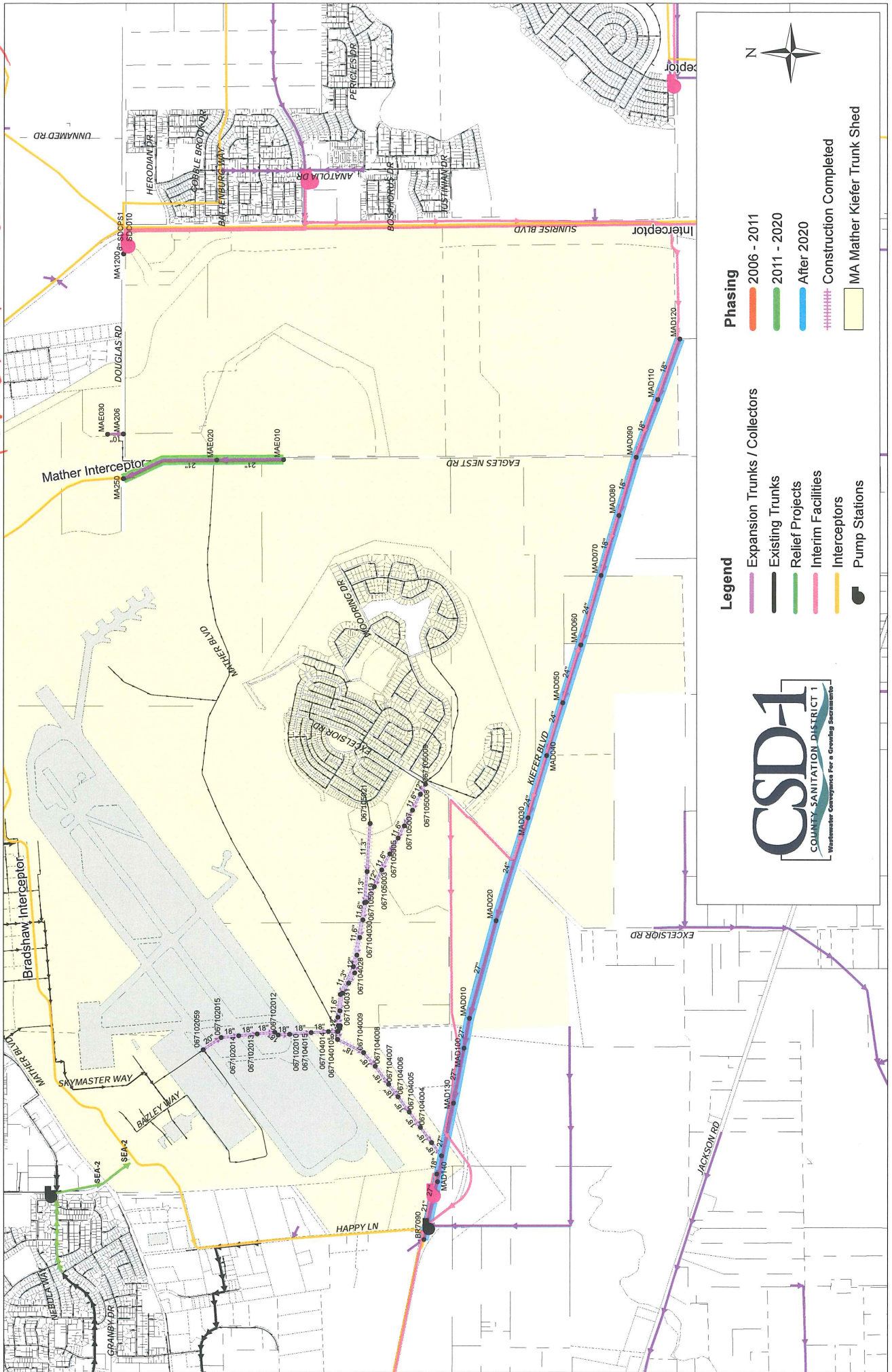


Legend

- Expansion Trunks / Collectors
- Existing Trunks
- Relief Projects
- Interim Facilities
- Interceptors
- Pump Stations



MA MATHER KIEFER PROJECT PHASING (ORIGINAL CLEAN COPY)



Phasing

- 2006 - 2011
- 2011 - 2020
- After 2020
- - - - - Construction Completed
- MA Mather Kiefer Trunk Shed

Legend

- Expansion Trunks / Collectors
- Existing Trunks
- Relief Projects
- Interim Facilities
- Interceptors
- Pump Stations




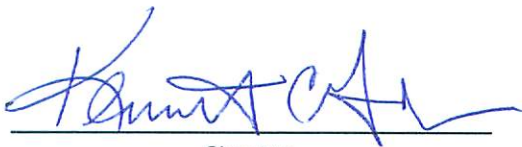
APPENDIX B

SASD DEVIATION FROM STANDARDS REQUEST



REQUEST FOR DEVIATION FROM STANDARDS AND SPECIFICATIONS

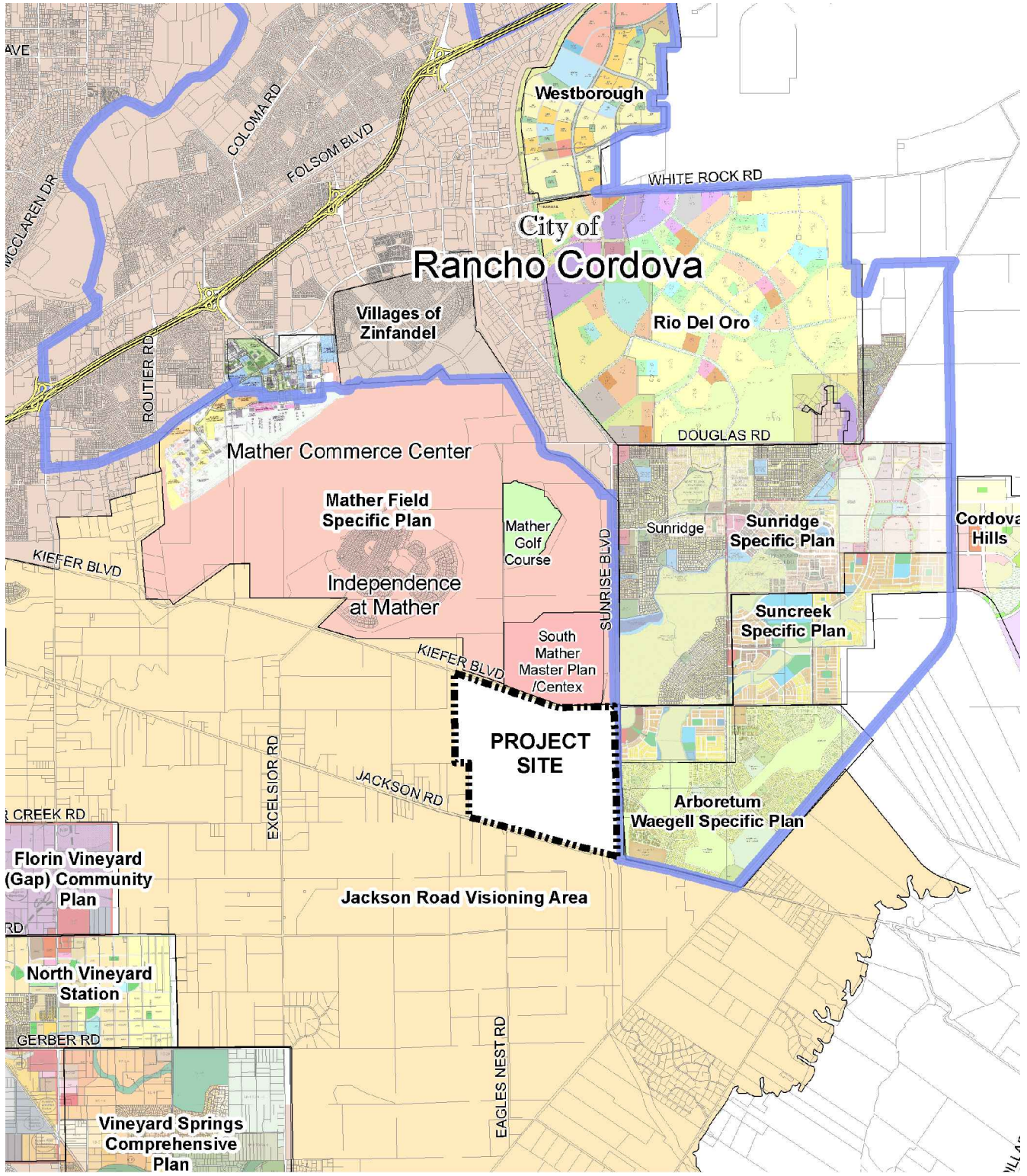
(Use additional sheets and attach plans as needed)

Improvement Plan, Project Title, or Location:	Tracking No. <i>(District Use Only)</i>
Brief Project Description: <u>Adjacent to Keifer Blvd. to the South & Eagles Nest Road</u>	 <p style="text-align: center;">Place PE Stamp Here</p>
Engineer of Record: <u>Kenneth C. Giberson</u> <small>(Print Name)</small>  _____ Signature	
_____ (Date) <u>6/5/13</u>	
Description of Deviation: For consideration of flows being generated at 0 ESD per acre for open space preserve (440 acres)	
Reason for Deviation: Newbridge's open space is to remain undeveloped, therefore not requiring sewer facilities.	
Mitigation Measures for Deviation:	
District Use Only	Plan Checker or Project Manager: _____ Date Received: _____ Comments: _____ _____ Approval Authority Signature Approved: Yes or No (circle) Comments: _____ _____

APPENDIX C

EXHIBITS A-H

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There are no references in this drawing.



NOT TO SCALE

NEWBRIDGE

Exhibit A - VICINITY MAP Sanitary Sewer Study

SACRAMENTO COUNTY, CALIFORNIA

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
November, 2013

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NOT TO SCALE

NEWBRIDGE

SACRAMENTO COUNTY, CALIFORNIA

Exhibit B Topographic and Aerial Photo Map

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS

November, 2013

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NEWBRIDGE

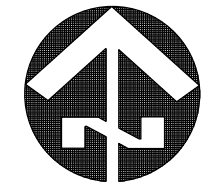
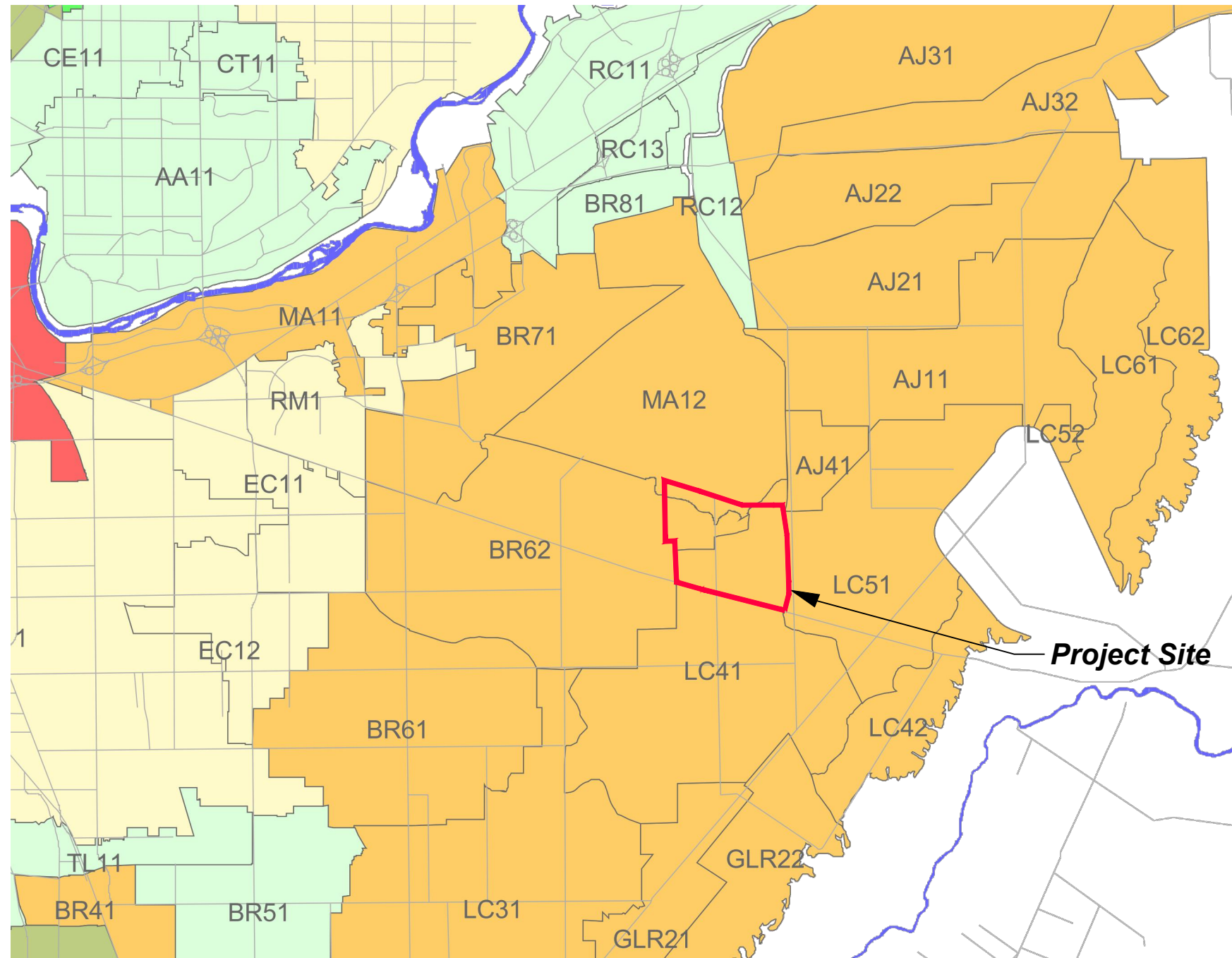
Exhibit C - LAND USE DIAGRAM Sanitary Sewer Study

SACRAMENTO COUNTY, CALIFORNIA

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS

June, 2013

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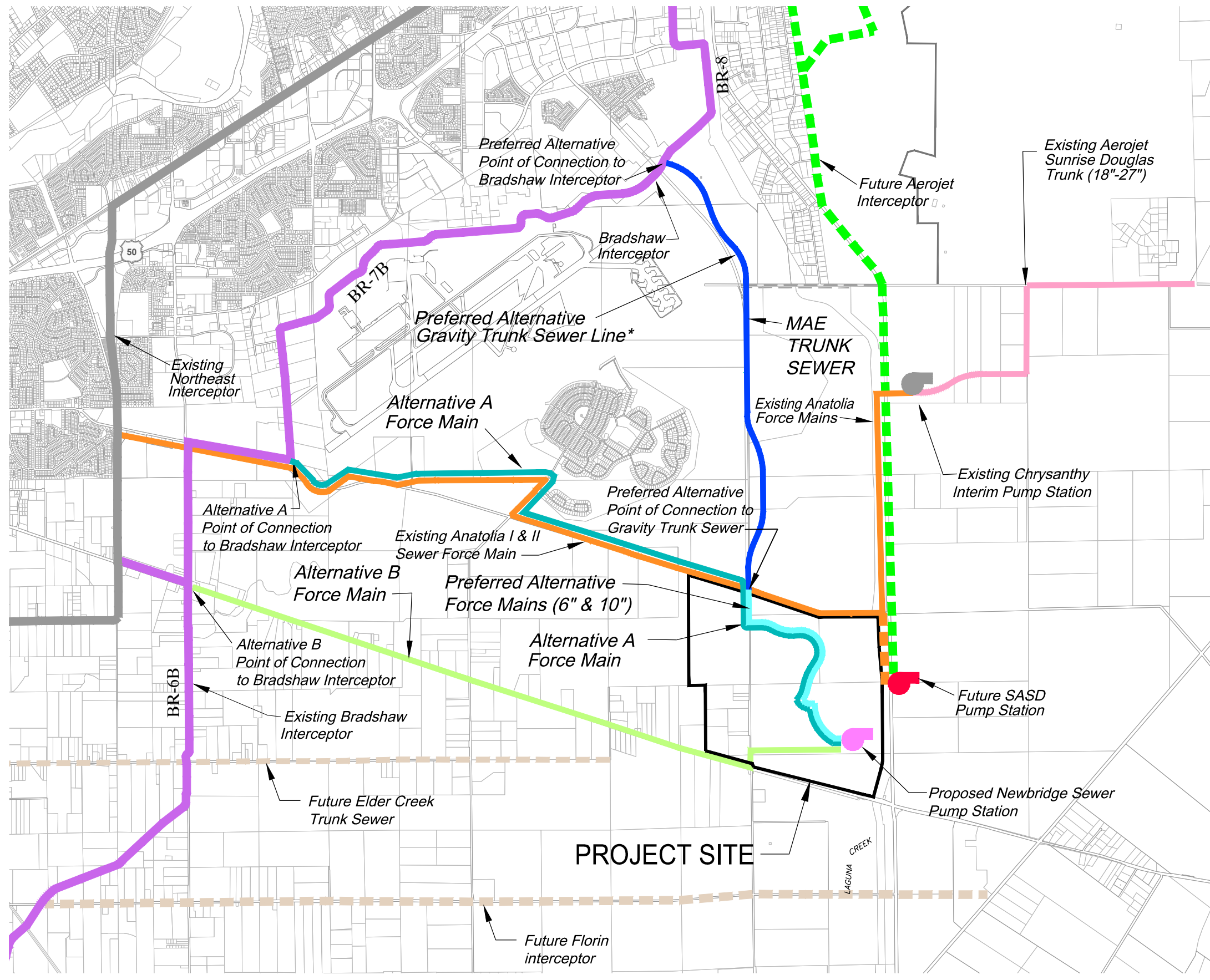
NEWBRIDGE

SACRAMENTO COUNTY, CALIFORNIA

Exhibit D
SRCSD Interceptor Basin Plan

MACKAY & SOMPS
ENGINEERS PLANNERS SURVEYORS
June, 2013

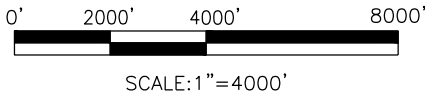
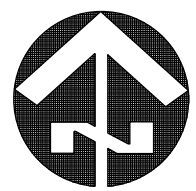
8-05-2013 10:02:11 aborgen P:\1945\master_plans\2013 Updates\sewer\Exhibit F Sewer Interceptor and Trunk Plan.dwg
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LEGEND

- EXISTING NORTHEAST INTERCEPTOR
- EXISTING BRADSHAW INTERCEPTOR
- EXISTING ANATOLIA FORCE MAIN
- PROPOSED NEWBRIDGE FORCE MAINS (6" & 10")
- PROPOSED ZINFANDEL DRIVE/MAE TRUNK SEWER
- ALTERNATIVE A FORCE MAIN
- ALTERNATIVE B FORCE MAIN
- FUTURE ELDER CREEK TRUNK SEWER
- FUTURE FLORIN ROAD INTERCEPTOR
- FUTURE AEROJET INTERCEPTOR
- EXISTING CHRYSANTHY INTERIM SEWER PUMP STATION
- PROPOSED NEWBRIDGE SEWER PUMP STATION
- FUTURE SASD SEWER PUMP STATION

* FORCE MAINS WILL BE EXTENDED TO BRADSHAW INTERCEPTOR ALONG THIS SAME ALIGNMENT IF THE MAE TRUNK SEWER HASN'T BEEN CONSTRUCTED WHEN SERVICE TO NEWBRIDGE IS REQUIRED.

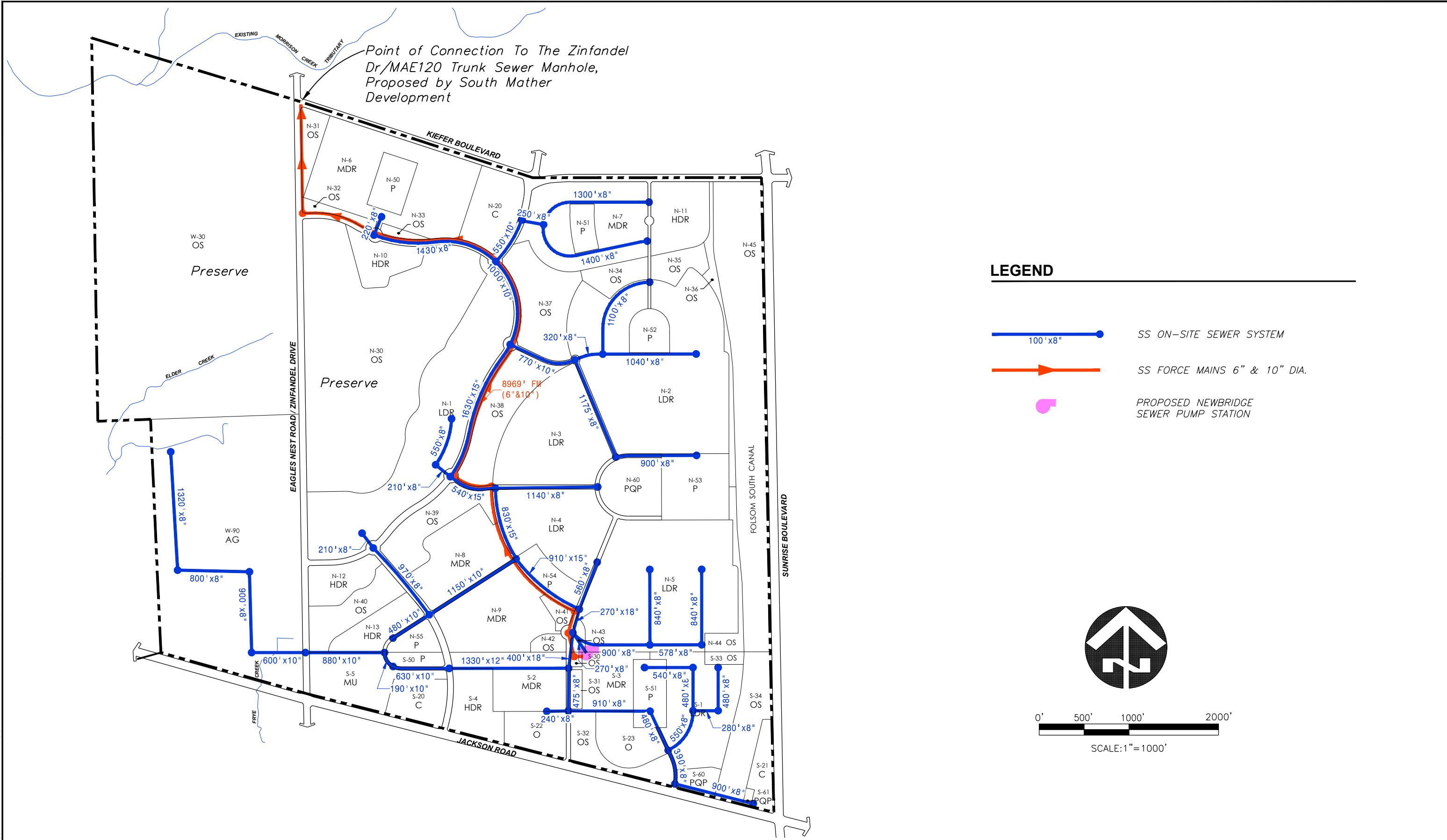


NEWBRIDGE

SACRAMENTO COUNTY, CALIFORNIA

Exhibit F Off-Site Sewer Interceptor and Trunk Sewer Plan

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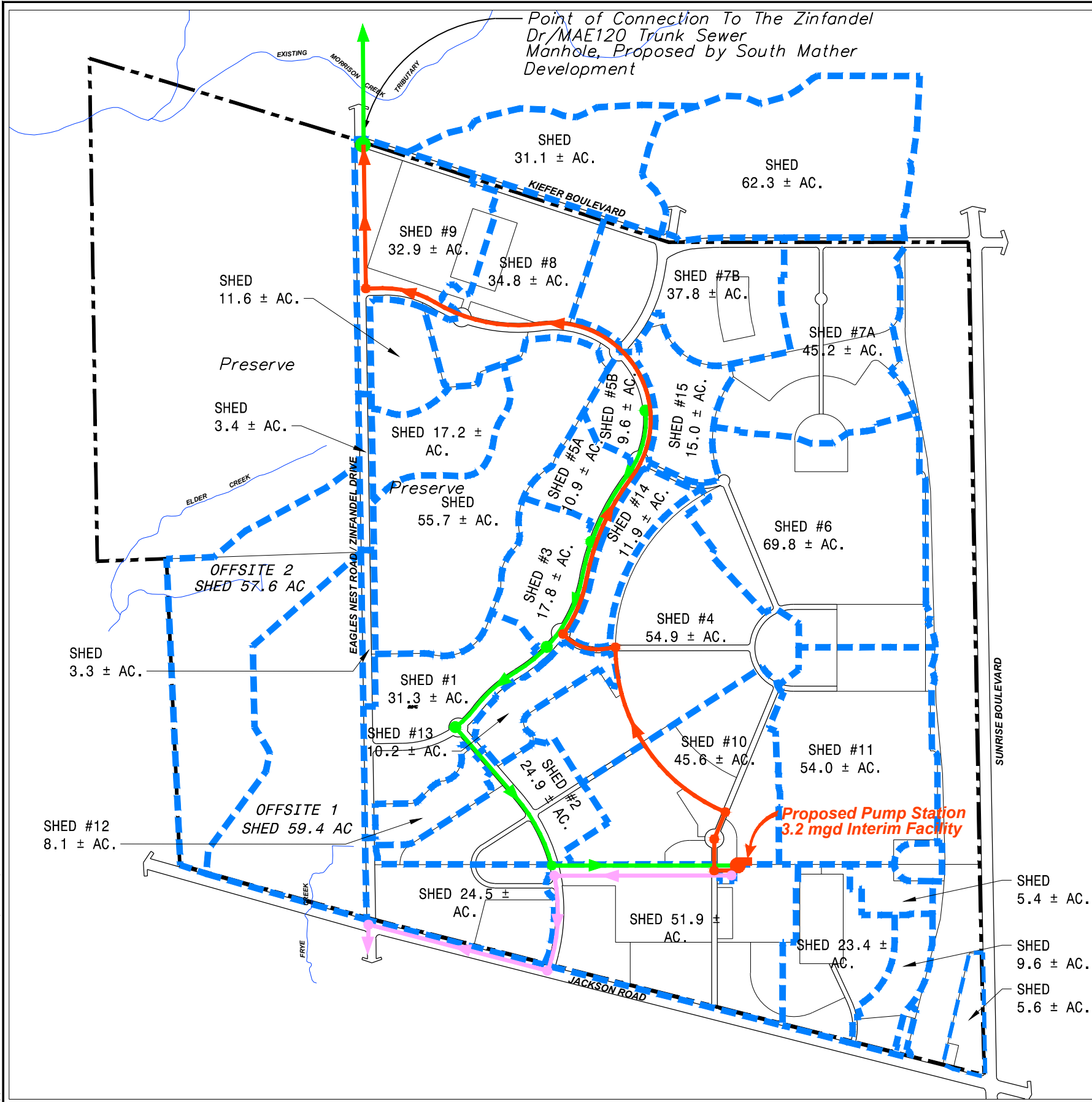


NEWBRIDGE






SACRAMENTO COUNTY, CALIFORNIA

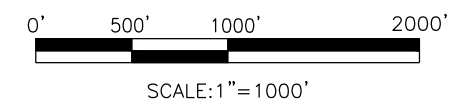
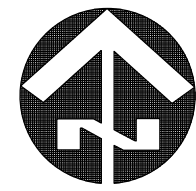
Exhibit G On-Site Preliminary Sanitary Sewer System Diagram

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LEGEND

-  SS SHED AREAS
-  SS GRAVITY TRUNK
-  SS GRAVITY TRUNK DRY LINE
-  SS FORCE MAINS 6" & 10" DIA.
-  SS LIFT STATION



NEWBRIDGE

SACRAMENTO COUNTY, CALIFORNIA

Exhibit H
On-Site Preliminary Sanitary Sewer Shed Map

**NEW BRIDGE and MATHER SOUTH
COMPREHENSIVE SEWER CALCULATIONS**

Node ID	Area by Land Use							Area		ESD		ADWF	Q _{II}	PF	Q	Q _d	Pipe Size	Slope	Cum Peak Velocity	Depth to invert
	RD5 (6ESD/AC)	RD7 (7ESD/AC)	SCHOOL (6ESD/AC)	COMM (6ESD/AC)	PARKS (6ESD/AC)	INDUS (6ESD/AC)	Actual Residential Lot Count	Per Node (AC)	Cum. (AC)	by Land Use/Node	Cum.	(mgd)	(mgd)		PDWF (mgd)	PWWF (mgd)	(in)	(ft/ft)	(fps)	(ft)
NB								622	622	4263	4263	1.322	0.871	1.675	2.213	3.084	24	0.0010	2.4	15.4
13						33.0		33.0	655.0	198	4461	1.383	0.917	1.671	2.310	3.227	24	0.0010	2.5	15.4
12A							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
12B			160.0				0	160.0		960	960	0.298	0.000	1.806	0.537	0.537	12	0.0020	2.1	8.5
12							0	0.0	815.0	0	5421	1.681	1.141	1.653	2.777	3.918	27	0.0010	2.6	8.0
11A							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
11B			181.0				0	181.0		1086	1086	0.337	0.000	1.795	0.604	0.604	12	0.0020	2.4	8.4
11							0	0.0	996.0	0	6507	2.017	1.394	1.636	3.300	4.694	27	0.0010	2.7	9.8
10A							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
10B			145.0				0	145.0		870	870	0.270	0.000	1.814	0.489	0.489	21	0.0010	1.5	10.1
10							0	0.0	1141.0	0	7377	2.287	1.597	1.624	3.714	5.311	27	0.0010	2.8	9.8
9A							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
9B			152.0				0	152.0		912	912	0.283	0.000	1.810	0.512	0.512	24	0.0010	1.5	12.0
9								0.0	1293.0	0	8289	2.570	1.810	1.613	4.145	5.955	30	0.0010	2.9	32.0
8B					201.0		0	201.0		1206	1206	0.374	0.000	1.786	0.668	0.668	15	0.0015	1.9	8.3
8							0	0.0	1494.0	0	9495	2.943	2.092	1.600	4.710	6.802	30	0.0010	2.9	35.0
7A							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
7							0					0.000	0.000	3.500	0.000	0.000		0.0050	0.0	0.0
6A							0					0.000	0.000	3.500	0.000	0.000		0.0100	0.0	0.0
6B					182.9			182.9		1098	1098	0.340	0.000	1.794	0.611	0.611	12	0.0020	2.1	23.0
6							0	0.0	1677.0	0	10593	3.284	2.348	1.590	5.220	7.568	30	0.0010	3.0	23.0
5					18.6		0	18.6	1696.0	112	10705	3.319	2.374	1.589	5.272	7.647	30	0.0010	3.0	32.0
4					40.5			40.5	1736.0	243	10948	3.394	2.430	1.587	5.385	7.815	30	0.0010	3.0	34.5
3A-3.2							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
3A-3.1							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
3A-3							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
3A-2							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
3A-1							0					0.000	0.000	0.000	0.000	0.000		0.0000		0.0
3B				28.0			0	28.0		168	168	0.052	0.000	1.947	0.101	0.101	8	0.0035	1.6	34.0
3							0	0.0	1764.0	0	11116	3.446	2.470	1.585	5.462	7.932	30	0.0010	3.0	34.0
2A				8.0				8.0		48	48	0.015	0.000	2.042	0.030	0.030	8	0.0035	1.1	34.0
2B				7.6				7.6		46	46	0.014	0.000	2.045	0.029	0.029	8	0.0035	1.1	34.0
2							0	0.0	1780.0	0	11210	3.475	2.492	1.584	5.506	7.998	30	0.0010	3.0	34.0
1A-4				191.7			0	191.7		1151	1151	0.357	0.000	1.790	0.639	0.639	24	0.0015	1.8	33.0
1A-3				5.9			0	5.9		36	36	0.011	0.000	2.062	0.023	0.023	15	0.0015	0.7	33.0
1A-2				27.3			0	27.3		164	164	0.051	0.000	1.949	0.099	0.099	8	0.0035	1.6	33.0
1A-1				6.2			0	6.2		38	38	0.012	0.000	2.058	0.024	0.024	15	0.0015	0.7	33.0
1B				53.1			0	53.1		319	319	0.099	0.000	1.897	0.188	0.188	8	0.0035	1.9	25.0
1							0	0.0	2064.0	0	12918	4.005	2.890	1.571	6.290	9.180	30	0.0010	3.2	34.5
1-ZIN								0.0	2064.0	0	12918	4.005	2.890	1.571	6.290	9.180	30	0.0010	3.2	35.0

**Exhibit I
NEW BRIDGE and MATHER SOUTH
COMPREHENSIVE SEWER CALCULATIONS**