Western Municipal Water District

Standard Operating Procedures

Upper SARI System
Maintenance Access Structure (MAS)
Inspection and Documentation

APPROVED: 

Wastewater Operations Manager _____ Date _____

Annual Reviewer				
Review Date	7/2011	7/2012	7/2013	7/2014

2. Evaluate the seriousness of the detected problem
3. Locate the position of problems
4. Provide clear, concise, and meaningful management reports regarding identified problems
5. Provide sufficient information to prepare a corrective plan or strategy.

In addition, information obtained during inspection activities can aid in identifying existing leaks into the system or potential problems which could lead to development of leaks and/or Sanitary Sewer Overflows. This information is critical to allow prompt correction of any problems found.

Because MAS's are part of the SARI System, they require the same attention as the rest of this collection system. When located in streets, these structures are subject to vibrations and pounding of vehicle traffic. MAS's may settle at a different rate than the connected conveyance line, thus creating cracks in joints. Easement locations on private property are subject to misuse and changes of ground surface due to construction or gardening activities. The object of MAS inspections is therefore to determine the proper elevations or grades around the lid, to ensure the lid is not buried, and to examine the structure for integrity and functional capacity. An indication of the condition of the pipelines entering the MAS can also be achieved through observation of the content and volume of flows from a specific direction.

MAS Inspection Procedures

The MAS inspection process consists of five basic steps which include:

1. Location of MAS to be Inspected and Surrounding Area Check
2. Test Atmospheric Conditions and Follow Traffic Safety Procedures as necessary
3. MAS Entry and Inspection
4. Cleaning of Metal Parts and Gasket Replacement as Necessary
5. Closing of MAS Lid and Completion of Reports and/or Work Orders

Location of MAS to be Inspected and Surrounding Area Check

Locate MAS and check the general surrounding area for proper drainage away from the lid. Keep in mind that if the lid is excessively below or above the finished street grade, the structure will be subject to pounding due to traffic loads. In easement areas, the MAS lid should be two or more inches above the soil level around it (except where street elevations apply). Any grade or elevation defects should be noted on the inspection report form.

Test Atmospheric Conditions and Follow Traffic Safety Procedures as Necessary

Set up traffic control as required per the appropriate regulatory agency and test MAS atmospheric conditions using a gas detection device. All established safety policies and procedures must be followed during the entire inspection process.

MAS Entry and Inspection

Make entry into the MAS, following established confined space entry policy and procedures, and follow inspection form in documenting all observations. Document and defects noted such as:

1. Cracks or breaks in walls or bottoms
2. Failures of protective wall coatings
3. Infiltration in any place including estimation of flow
4. Joint security (no significant cracks)
5. Offsets or misalignment
6. Any grease or debris accumulation
7. Sluggish flows or evidence of backing up in MAS, which will trigger inspection of upstream and downstream MAS.
8. Any corrosion

Cleaning of Metal Parts and Gasket Replacement as Necessary

After the completion of the inspection process, it is a good time to conduct basic housekeeping activities as needed. Before closing any inner lids of an MAS, determine if the seal gasket needs to be replaced and any bolts that are severely worn should also be replaced. The surface of the structure should be properly cleaned using a wire brush prior to installing the new gasket (using a sealant product to ensure waterproofing as needed)

Closing of MAS Lid and Completion of Paperwork

Replace the MAS lid and look for evidence of warping or misfit. The lid should not rattle or "rock". The inspector needs to ensure that the MAS inspection form is properly identified and all data is completed included any written observations. Repair work that will need to be completed at a later date must be documented on a Maintenance Work Order.

MAS Inspection Form Overview

The following is an overview of the MAS Inspection form (Appendix B). The inspection form is divided into eight general areas:

1. Date, Inspector, and MAS identification information
2. General inspection

3. Structural Inspection
4. Hydraulic inspection
5. SARI System Information
6. Work Order Information

Areas that need to be filled in (where applicable) include the following:

Area 1 The inspector needs to fill in information that identifies date of inspection, MAS identification and inspector, as well as, photo documentation and traffic control conditions.

Area 2 The general inspection section requests that the inspector provide check box observations for six areas that include:

1. MAS Location
2. Cover, Ring and Frame Observations
3. Identify Lid cover size
4. General surface area observations
5. Assessment for odors
6. MAS structure type

Area 3 The Structural inspection section requests that the inspector provide check box observations for six areas that include:

1. Corrosion Protection for MAS
2. Cone
3. Riser
4. Shelf
5. Channel
6. MAS identification stake installed. In areas where the MAS is located in traffic, the stack should be placed on the side of the road outside of traffic (noting location of MAS on stake)

Area 4 The Hydraulic inspection section requests that the inspector provide check box observations for six areas that include:

1. Inflow indications
2. Surcharge Indication
3. Clarity of flow
4. Flow
5. Flow depth compared to adjacent manhole structures
6. Flow depth

Area 5 The SARI System Information section requests that the inspector provide observations and information for the following 12 areas:

1. MAS Diameter
2. Lid diameter
3. Lid bolted
4. Sealed watertight information
5. Location of seal
6. Inlet pipe diameter
7. Outlet pipe diameter
8. Connection
9. Connection size
10. Corrosion protection
11. Corrosion protection type
12. Identification stake

Area 6 The work order information section is used to identify additional work necessary at the MAS as well as priority identification

The form also includes areas for general comments of observations, maintenance work comments and an area for the supervisor to comment as necessary. It needs to also be noted that the inspector is to take as many photographs as possible of the surrounding area, inner MAS, and any other features of interest or where repair or follow-up will be necessary.

As the inspector, if you have any questions or concerns that may occur during the inspection process you are to contact your supervisor or senior operations technician for clarification.

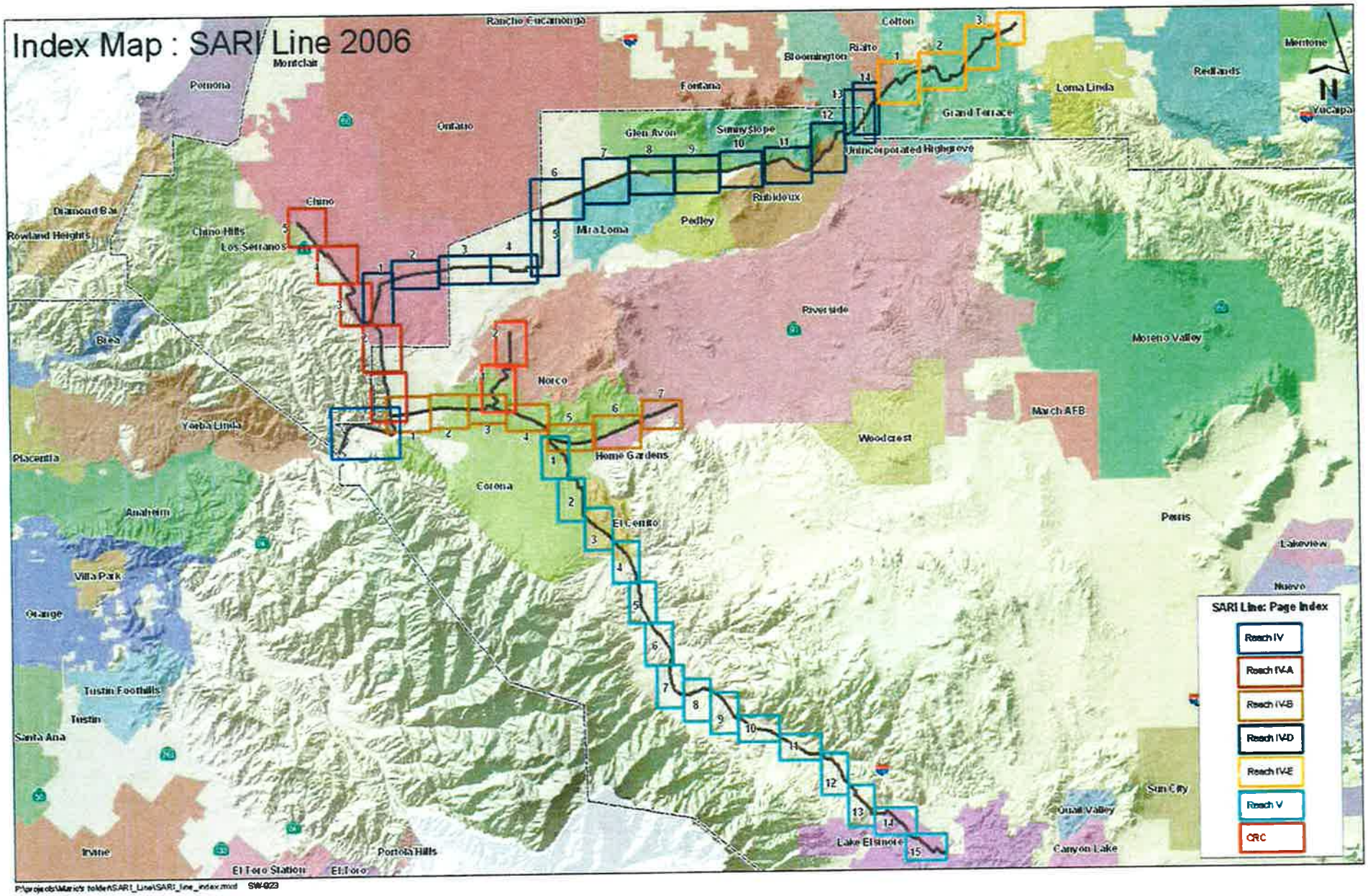
MAS Inspection Photo Documentation

Every Brine Line Maintenance Access Structure (MAS) that is conducted shall need to be documents using digital images. The following are required actions by staff when digitally documenting MAS in the field:

1. Digital photographs are to include a date and time stamp.
2. Digital photographs must be clearly identified when submitted with any inspection report.
3. All submitted digital photographs must be clear and detail all areas of the structure being inspected (both internal and external)
4. You can never take too many pictures.

Appendix A

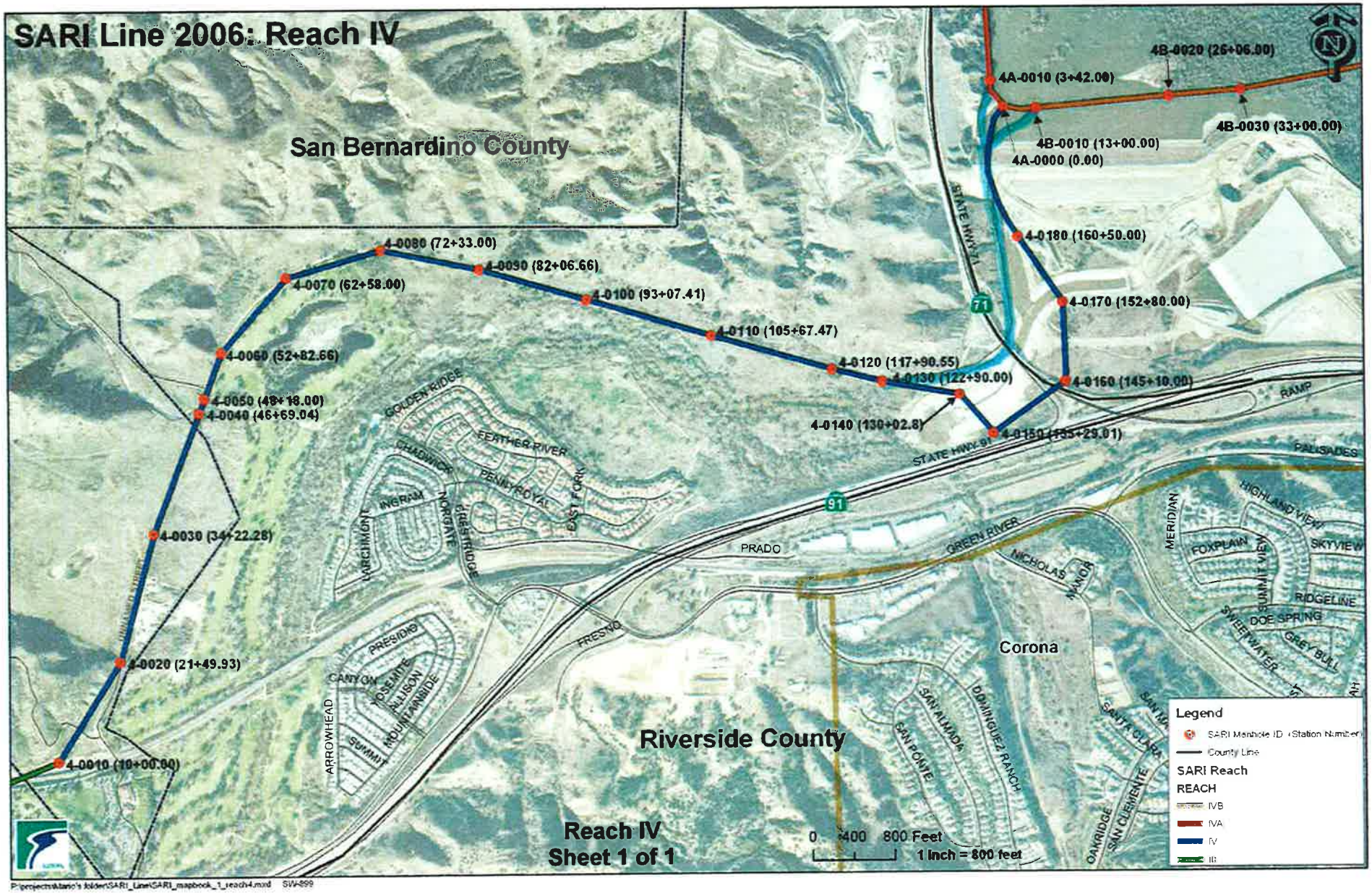
INDEX



P:\projects\Maria's folder\SARI_Line\SARI_line_index.mxd SW-023

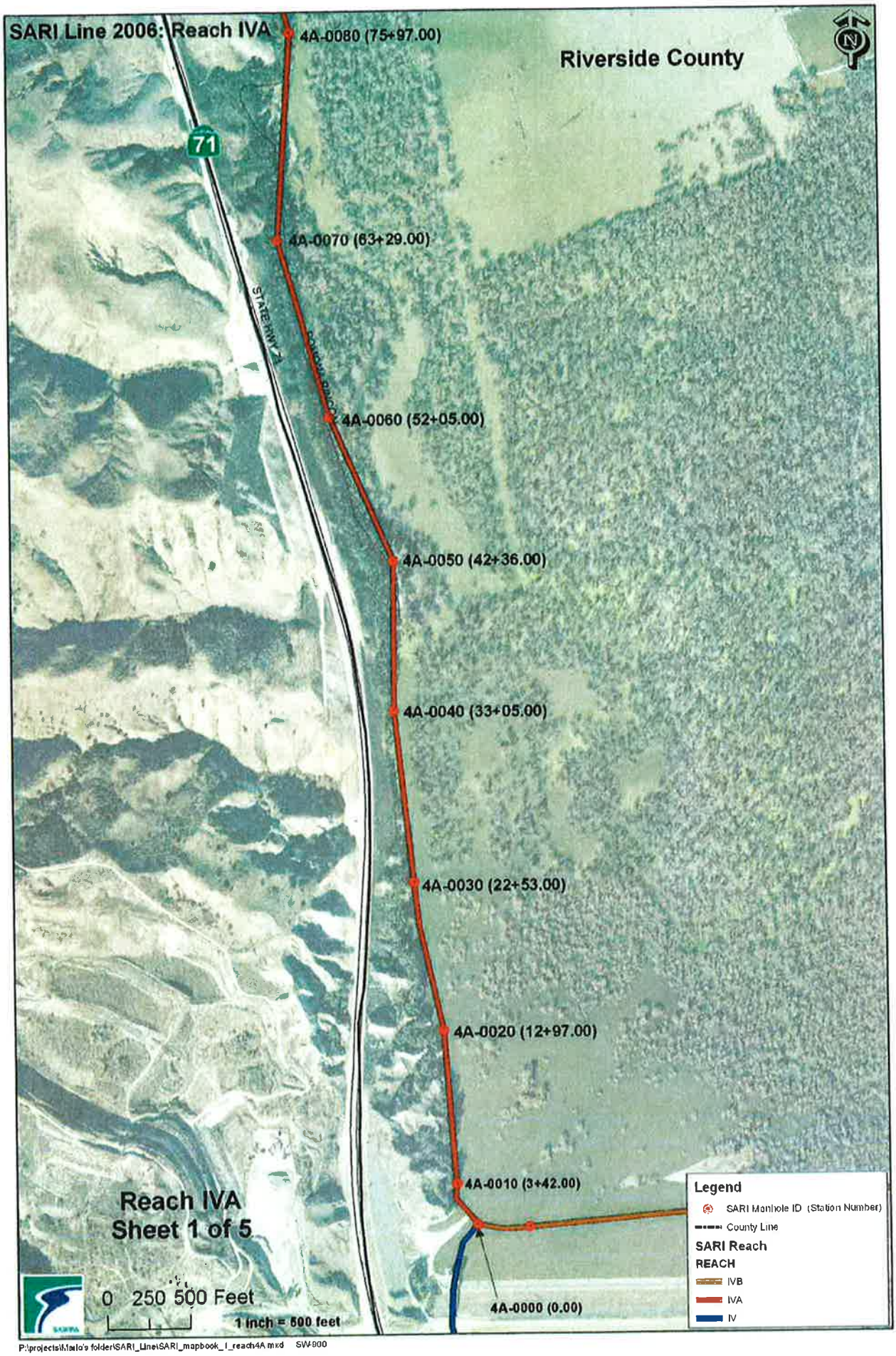
REACH

IV

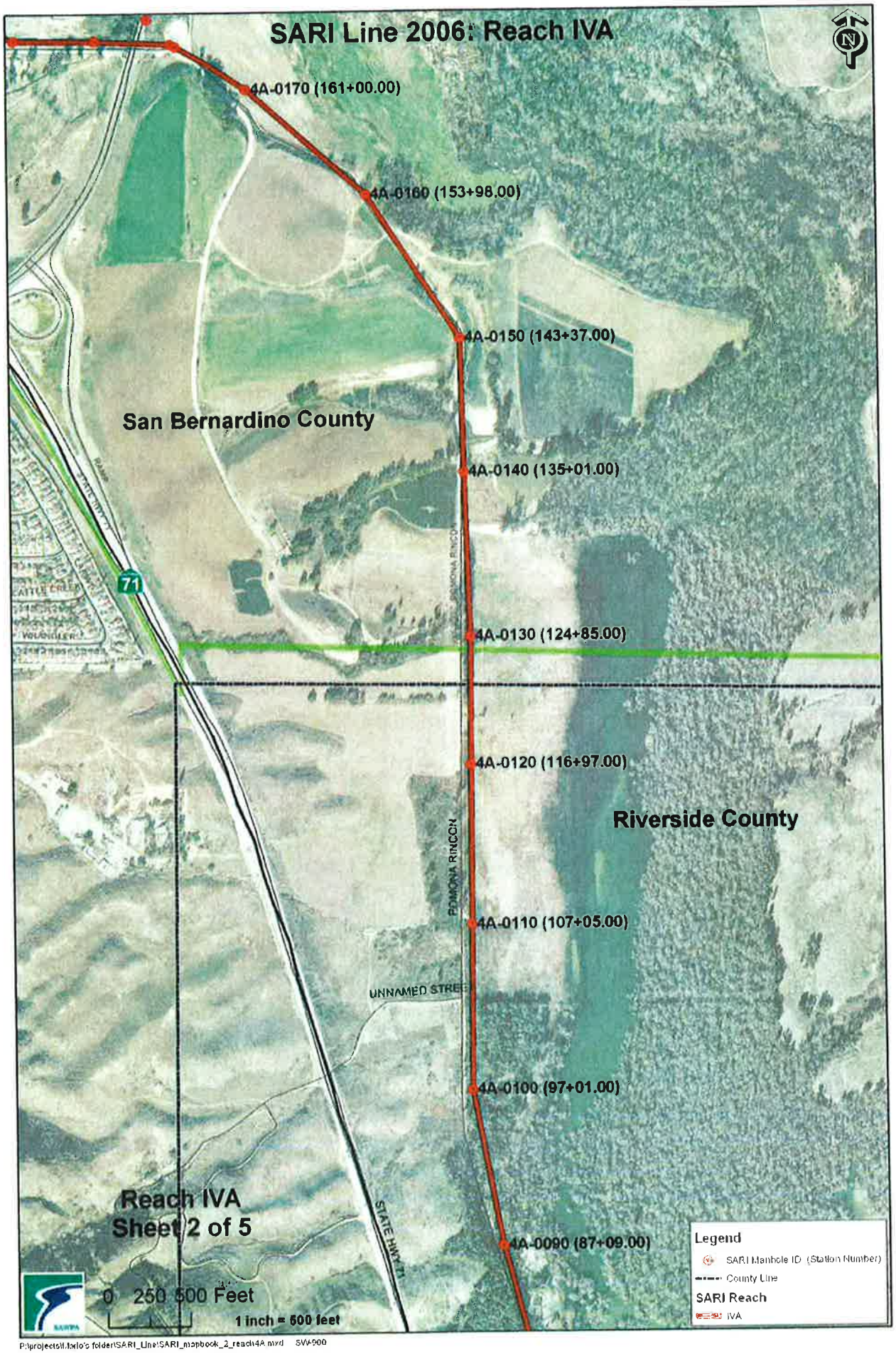

SARI Line 2006: Reach IV
San Bernardino County
Riverside County
4A-0010 (3+42.00)
4B-0020 (26+06.00)
4B-0030 (33+00.00)
4B-0010 (13+00.00)
4A-0000 (0.00)
4-0180 (160+50.00)
4-0170 (152+80.00)
4-0160 (145+10.00)
4-0150 (135+29.01)
4-0140 (130+02.8)
4-0130 (122+90.00)
4-0120 (117+90.55)
4-0110 (105+67.47)
4-0100 (93+07.41)
4-0090 (82+06.66)
4-0080 (72+33.00)
4-0070 (62+58.00)
4-0060 (52+82.66)
4-0050 (48+18.00)
4-0040 (46+69.04)
4-0030 (34+22.28)
4-0020 (21+49.93)
4-0010 (10+00.00)
STATE HWY-71
STATE HWY-91
RAMP
PALISADES
GOLDEN RIDGE
FEATHER RIVER
CHADWICK
PENNYROYAL
EAST FORK
INGRAM
HARCHMONT
NORGATE
GREENRIDGE
PRADO
GREEN RIVER
NICHOLAS
MERIDIAN
HIGHLAND VIEW
FOXPLAIN
SKYVIEW
RIDGELINE
DOE SPRING
SWEETWATER
GREY BULL
Corona
FRESNO
PRESIDIO
CANYON
YOSEMITE
ALLISON
MOUNTAINSIDE
SUMMIT
ARROWHEAD
SAN ALMADA
SAN PONTE
DOMINGUEZ RANCH
SANTA CLARA
OAKRIDGE
SAN CLEMENTE
Reach IV
Sheet 1 of 1
0 400 800 Feet
1 Inch = 800 feet
Legend
SARI Manhole ID (Station Number)
County Line
SARI Reach
REACH
IVB
IVA
IV
III
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_1_reach4.mxd SWA899

REACH

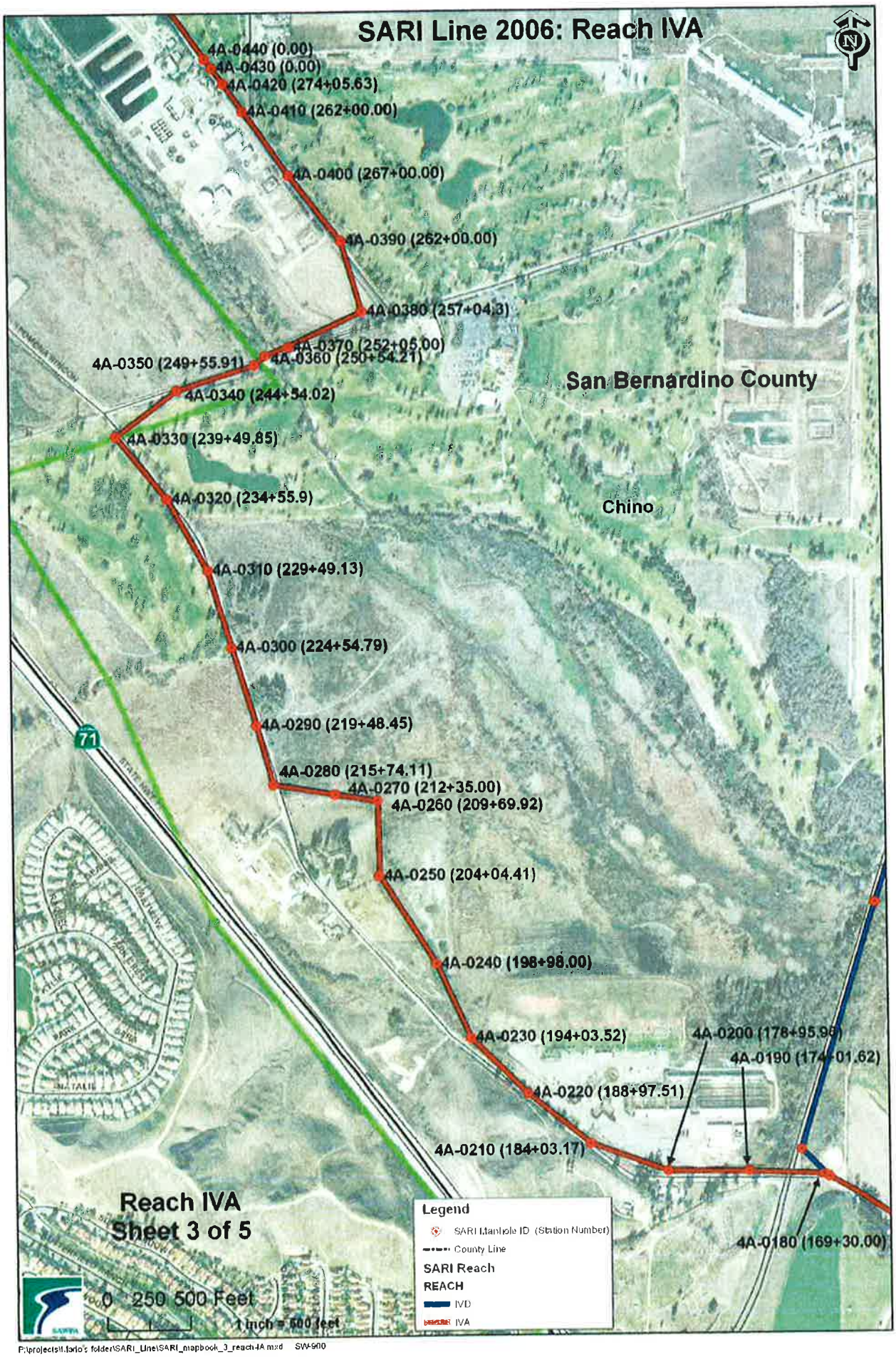
IV-A

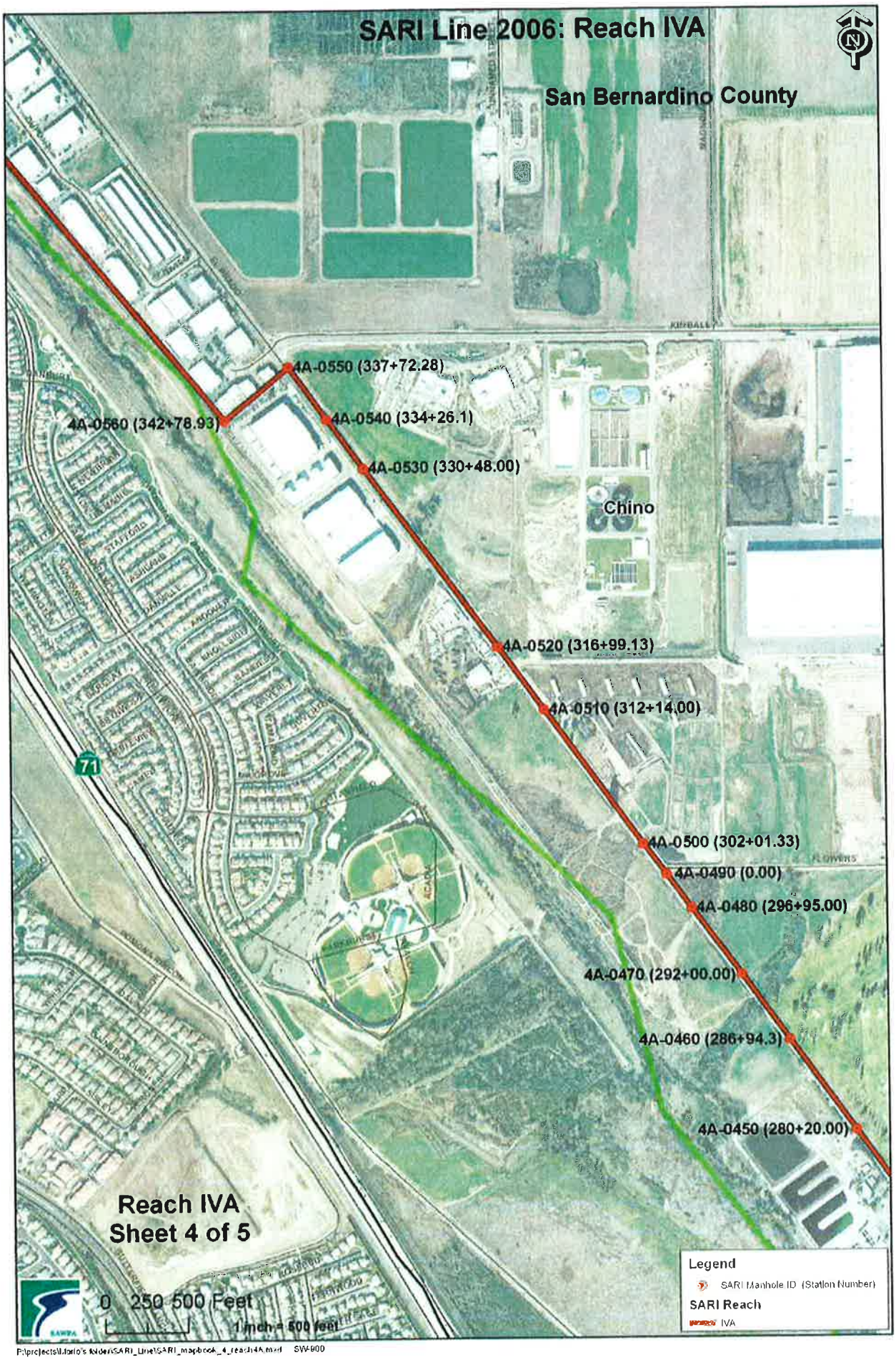


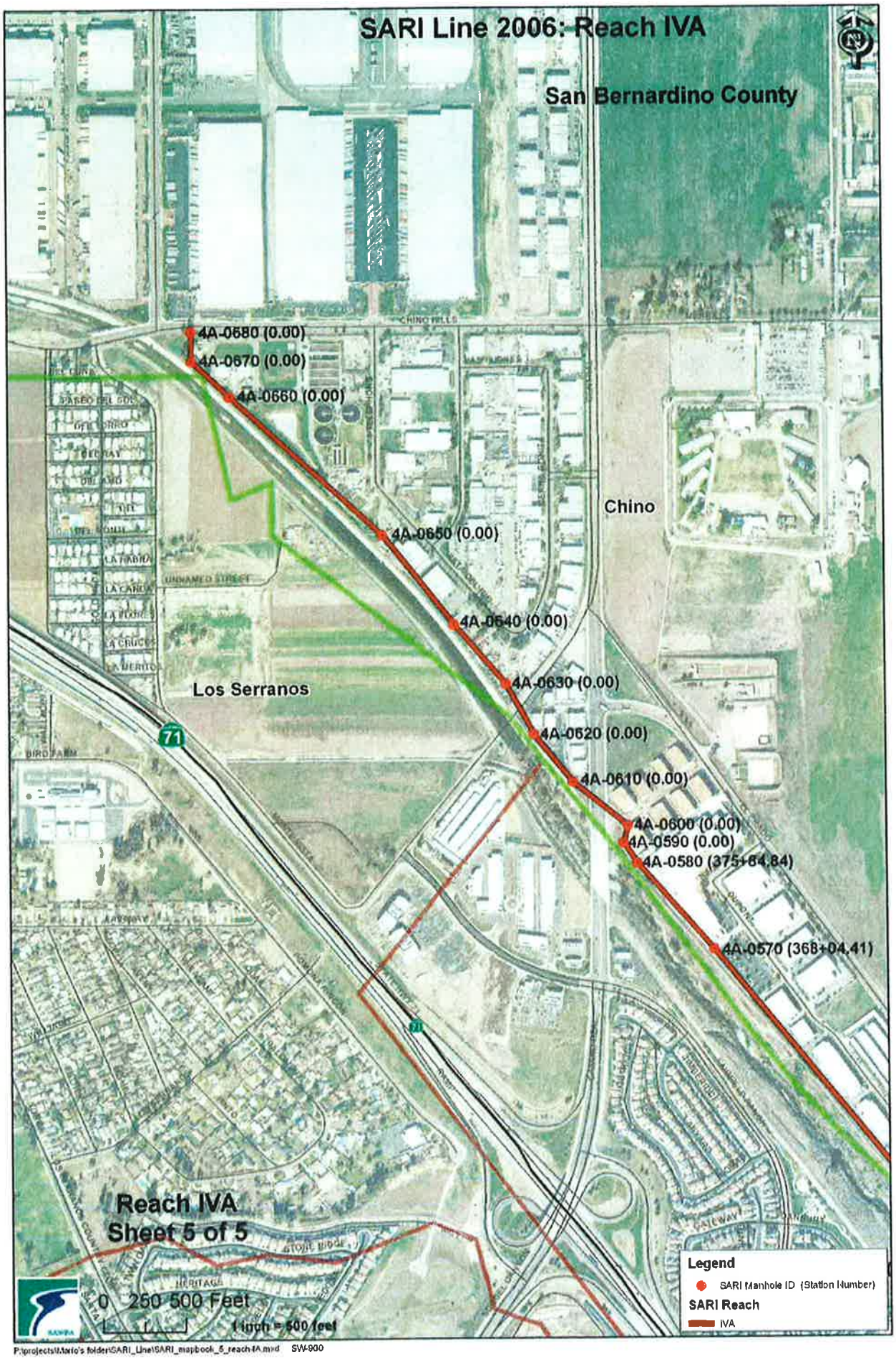
P:\projects\Malo's folder\SARI_Line\SARI_mapbook_1_reach4A.mxd SW-900



P:\projects\Mario's folder\SARI_Line\SARI_mapbook_2_reach4A.mxd SVA-500

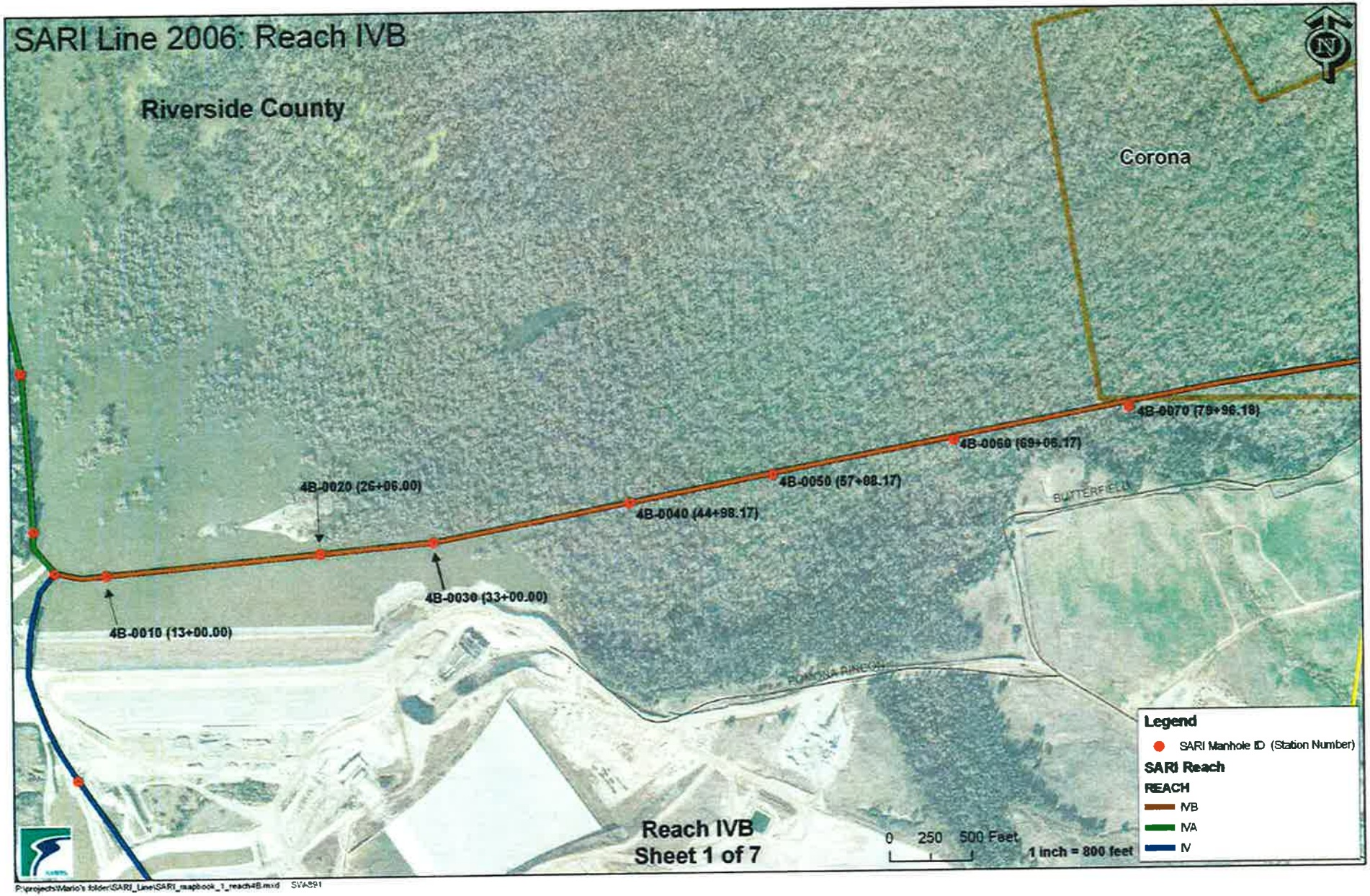

SARI Line 2006: Reach IVA
4A-0440 (0.00)
4A-0430 (0.00)
4A-0420 (274+05.63)
4A-0410 (262+00.00)
4A-0400 (267+00.00)
4A-0390 (262+00.00)
4A-0380 (257+04.3)
4A-0370 (252+05.00)
4A-0360 (250+54.21)
4A-0350 (249+55.91)
4A-0340 (244+54.02)
4A-0330 (239+49.85)
4A-0320 (234+55.9)
4A-0310 (229+49.13)
4A-0300 (224+54.79)
4A-0290 (219+48.45)
4A-0280 (215+74.11)
4A-0270 (212+35.00)
4A-0260 (209+69.92)
4A-0250 (204+04.41)
4A-0240 (198+98.00)
4A-0230 (194+03.52)
4A-0200 (178+95.99)
4A-0190 (174+01.62)
4A-0220 (188+97.51)
4A-0210 (184+03.17)
4A-0180 (169+30.00)
San Bernardino County
Chino
71
Reach IVA
Sheet 3 of 5
Legend
SARI Manhole ID (Station Number)
County Line
SARI Reach
REACH
IVD
IVA
0 250 500 Feet
1 inch = 500 feet
P:\projects\ll.lardo's folder\SARI_Line\SARI_mapbook_3_reach4A.mxd SW-900

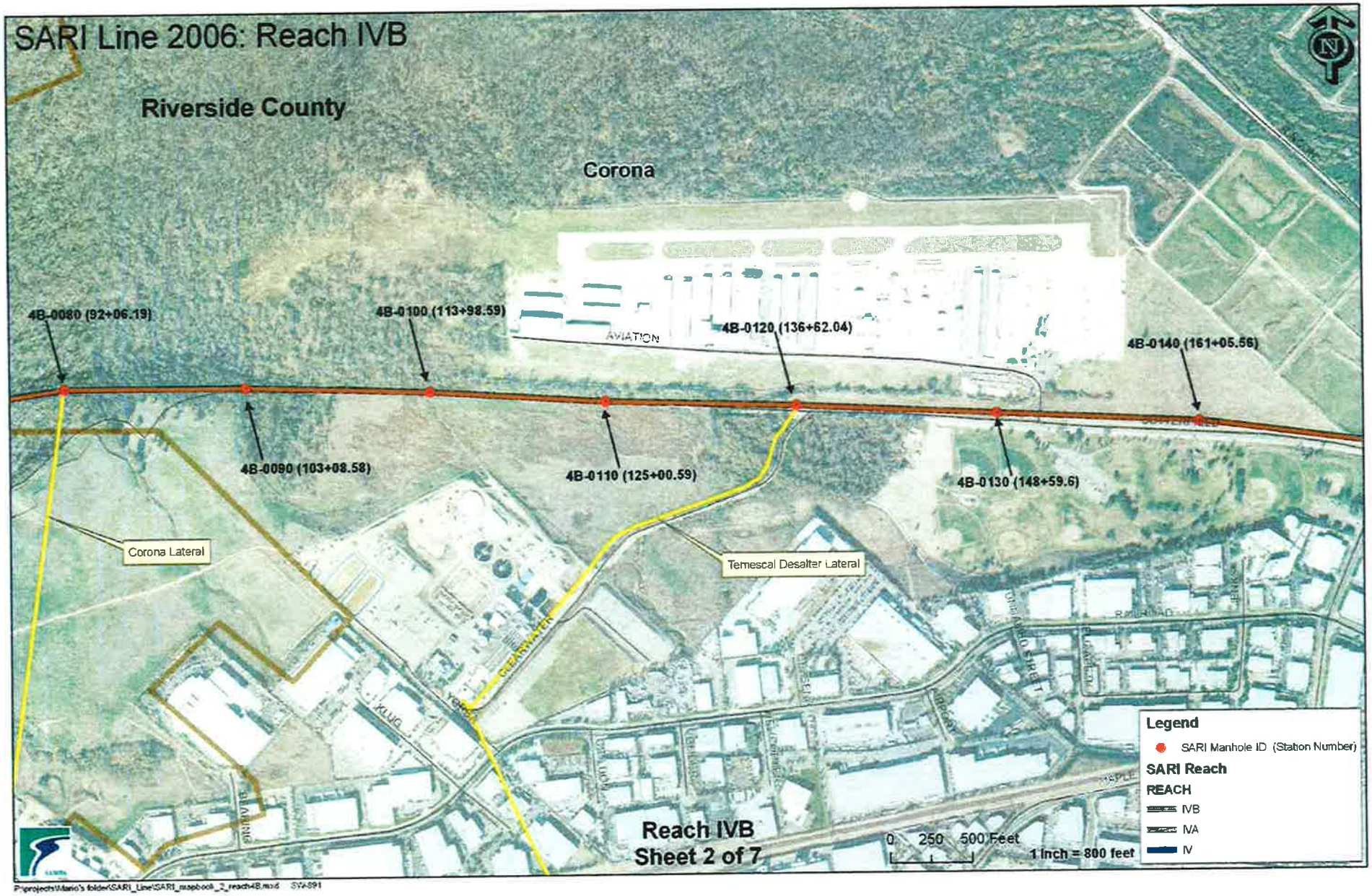

SARI Line 2006: Reach IVA
San Bernardino County
4A-0550 (337+72.28)
4A-0560 (342+78.93)
4A-0540 (334+26.1)
4A-0530 (330+48.00)
Chino
4A-0520 (316+99.13)
4A-0510 (312+14.00)
4A-0500 (302+01.33)
4A-0490 (0.00)
4A-0480 (296+95.00)
4A-0470 (292+00.00)
4A-0460 (286+94.3)
4A-0450 (280+20.00)
Reach IVA
Sheet 4 of 5
0 250 500 Feet
1 inch = 500 feet
Legend
SARI Manhole ID (Station Number)
SARI Reach
IVA
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_4_reach4A.mxd SW-900

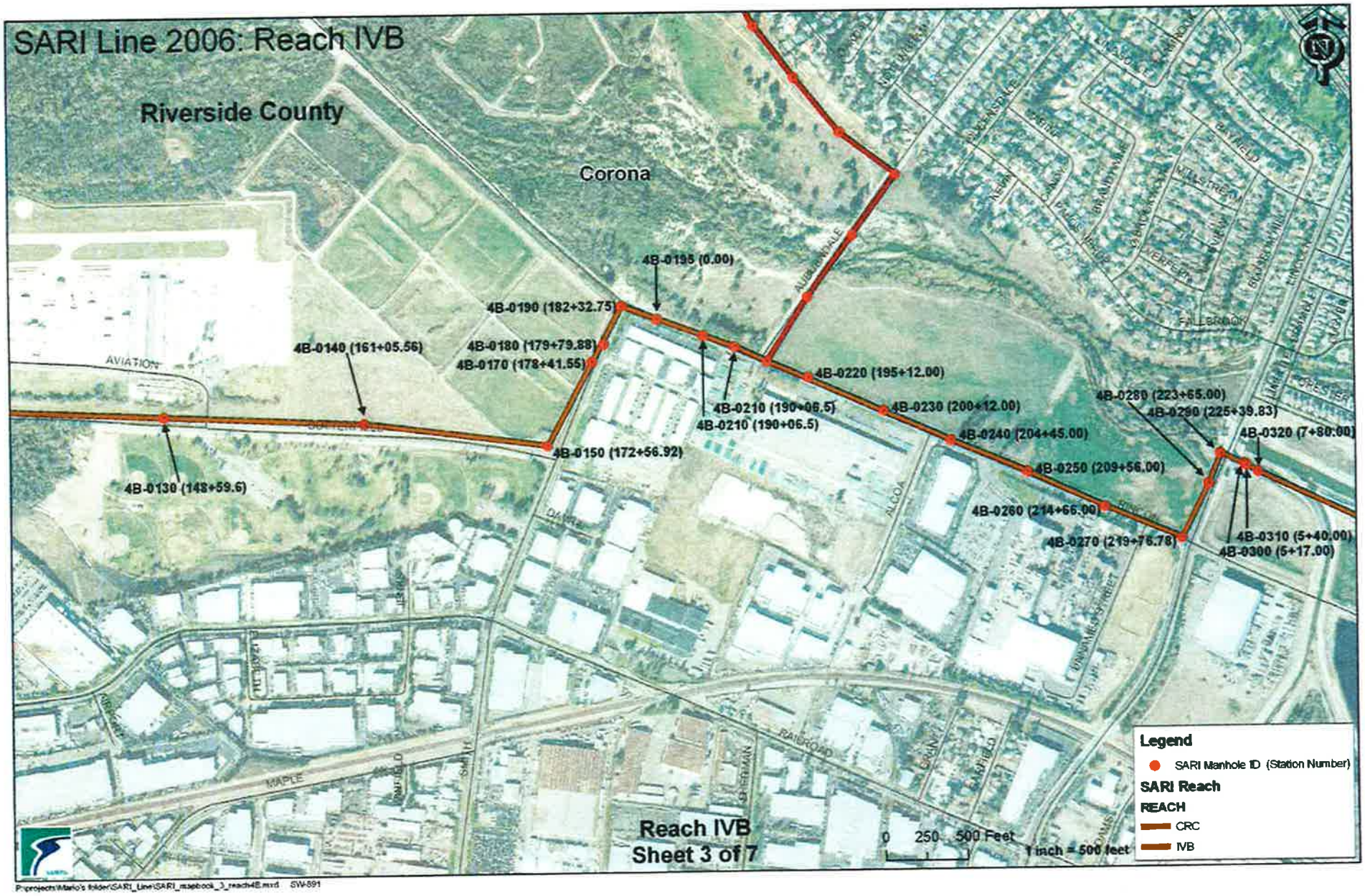

SARI Line 2006: Reach IVA
San Bernardino County
Chino
Los Serranos
4A-0680 (0.00)
4A-0670 (0.00)
4A-0660 (0.00)
4A-0650 (0.00)
4A-0640 (0.00)
4A-0630 (0.00)
4A-0620 (0.00)
4A-0610 (0.00)
4A-0600 (0.00)
4A-0590 (0.00)
4A-0580 (375+64.84)
4A-0570 (368+04.41)
Reach IVA
Sheet 5 of 5
0 250 500 Feet
1 inch = 500 feet
Legend
SARI Manhole ID (Station Number)
SARI Reach
IVA
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_5_reachIA.mxd SW-900

REACH

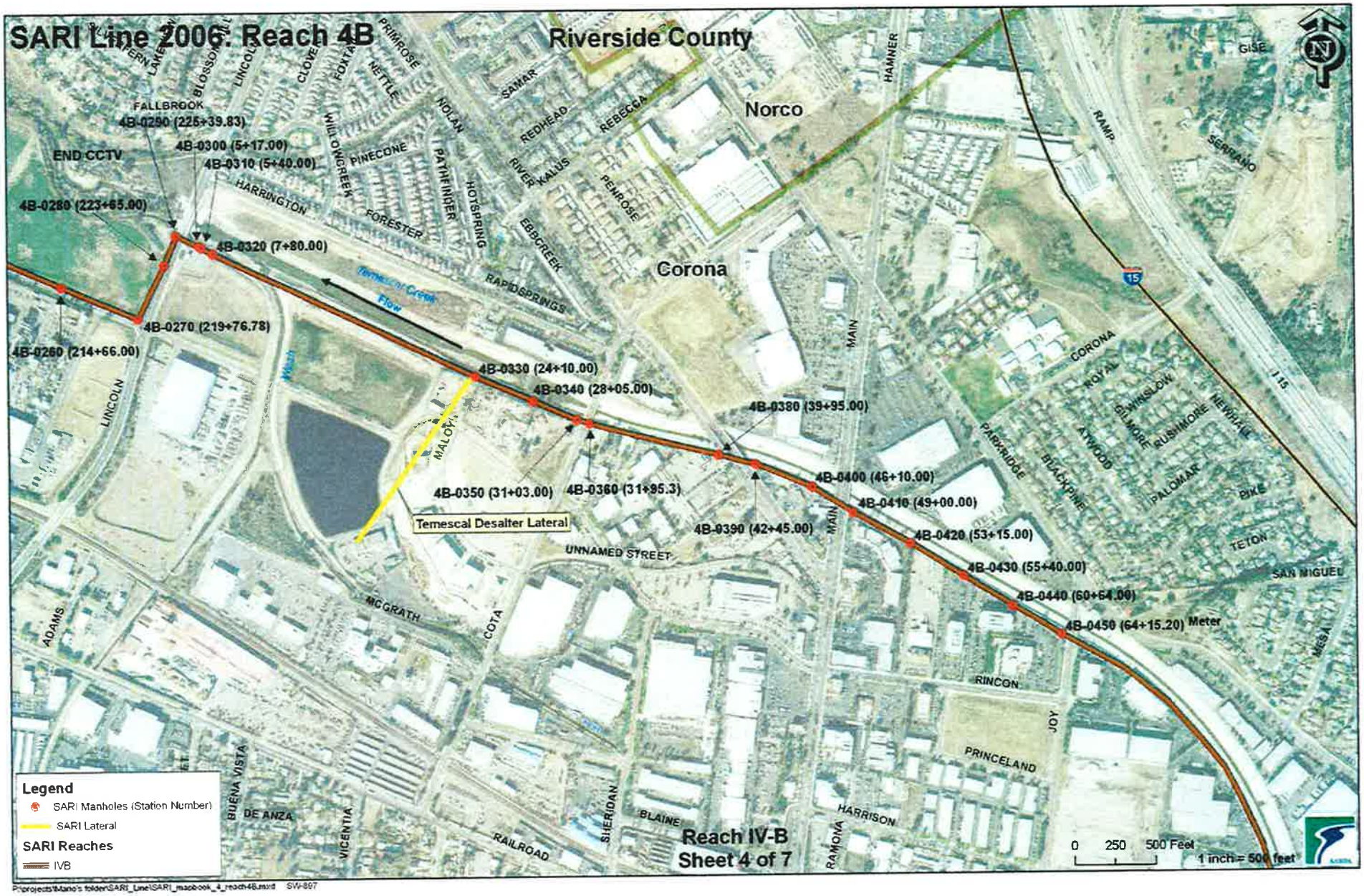
IV~B


SARI Line 2006: Reach IVB
Riverside County
Corona
4B-0070 (79+96.18)
4B-0060 (69+06.17)
4B-0050 (57+08.17)
4B-0040 (44+98.17)
4B-0030 (33+00.00)
4B-0020 (26+06.00)
4B-0010 (13+00.00)
BUTTERFIELD
POMONA RINCON
Reach IVB
Sheet 1 of 7
0 250 500 Feet
1 inch = 800 feet
Legend
SARI Manhole ID (Station Number)
SARI Reach
REACH
IVB
IVA
IV
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_1_reach4B.mxd SVA891

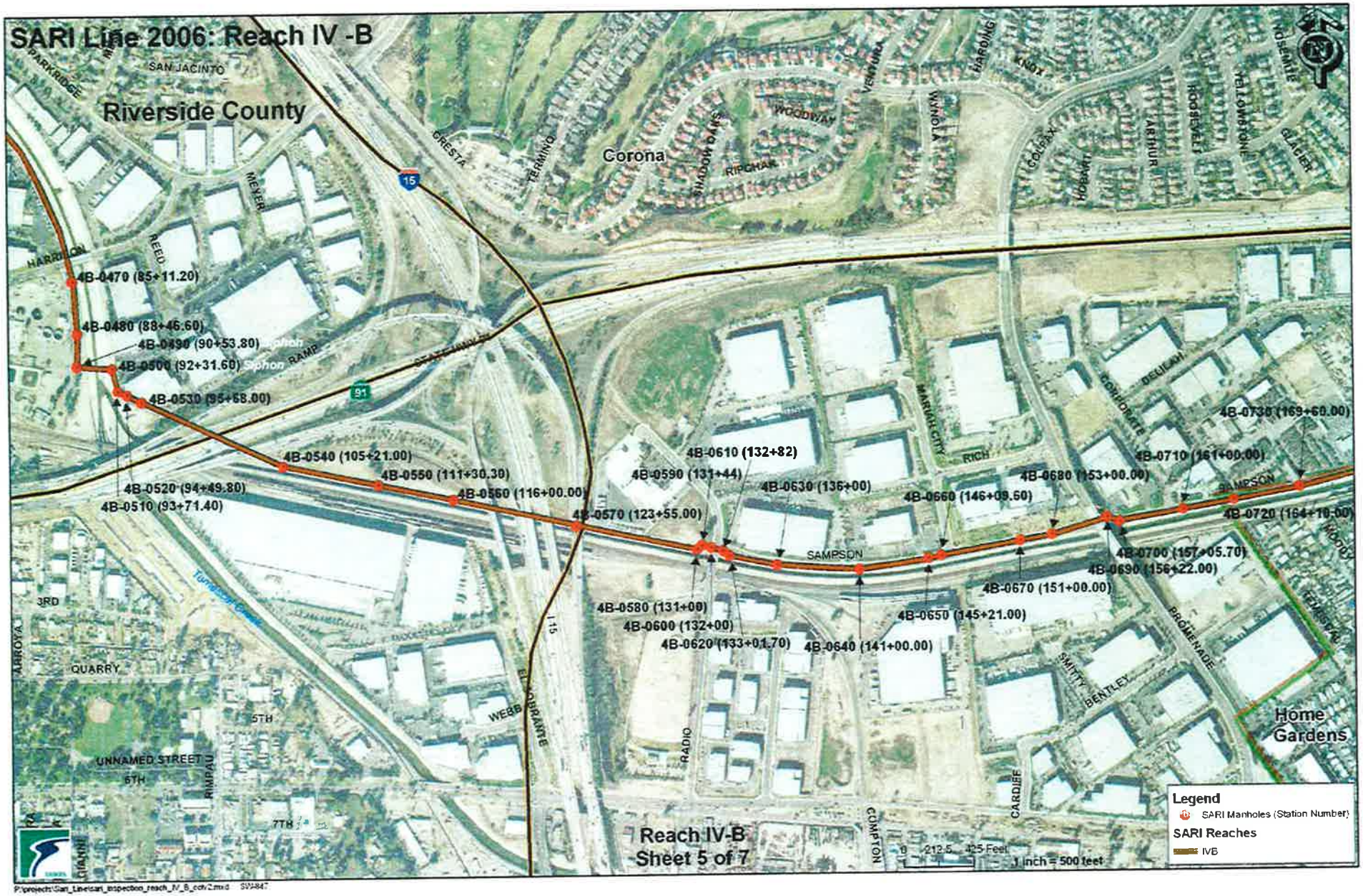

SARI Line 2006: Reach IVB
Riverside County
Corona
4B-0080 (92+06.19)
4B-0090 (103+08.58)
4B-0100 (113+98.59)
4B-0110 (125+00.59)
4B-0120 (136+62.04)
4B-0130 (148+59.6)
4B-0140 (161+05.56)
AVIATION
Corona Lateral
Temescal Desalter Lateral
Reach IVB
Sheet 2 of 7
0 250 500 Feet
1 inch = 800 feet
Legend
SARI Manhole ID (Station Number)
SARI Reach
REACH
IVB
IVA
IV



P:\projects\Mario's folder\SARI_Line\SARI_mapbook_3_reach4B.mxd SW-891

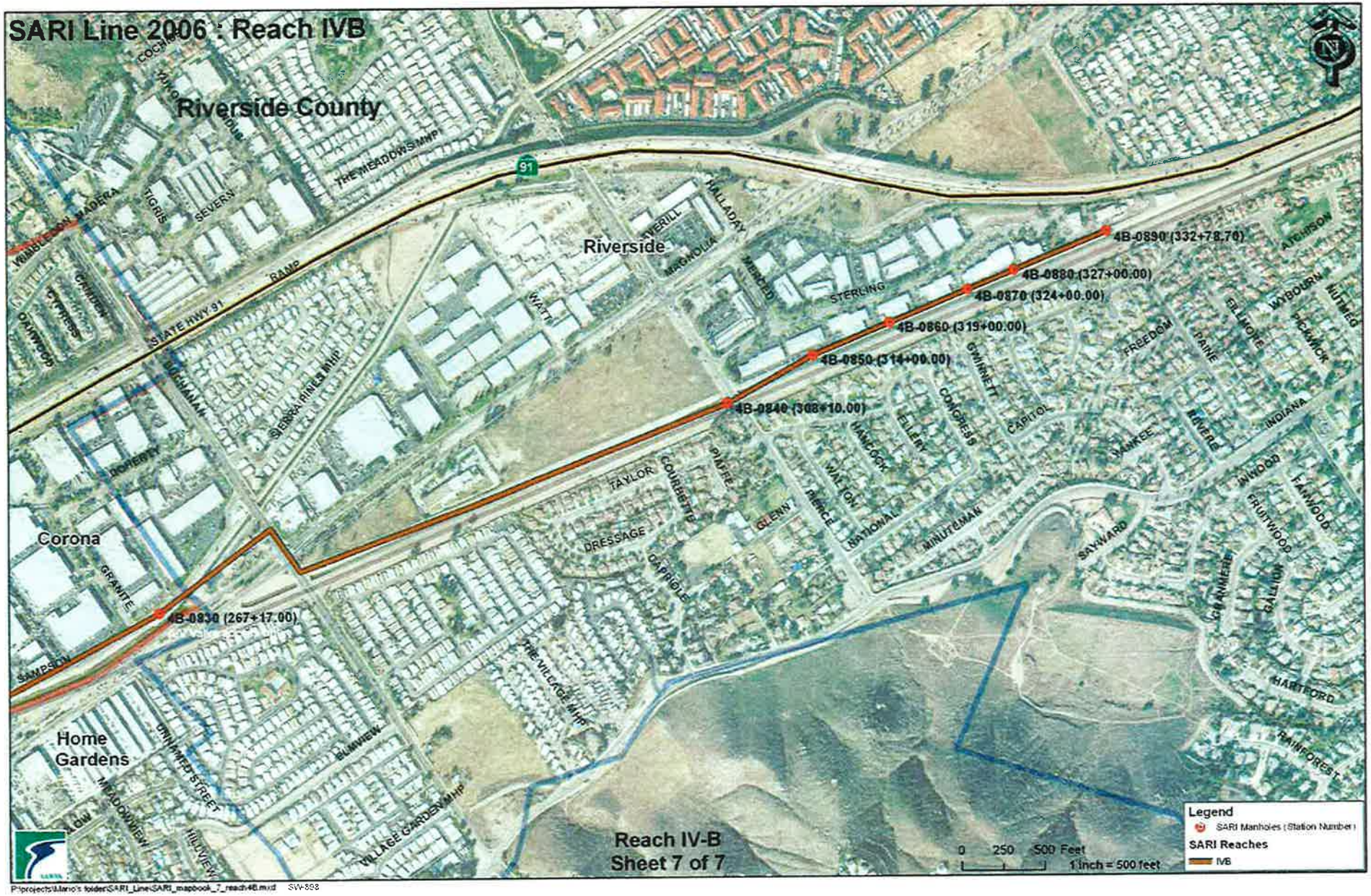


P:\projects\Mario's folder\SARI_Line\SARI_macbook_4_reach4B.mxd SVI-807



P:\projects\San_Jacinto\sari_inspection_reach_IV_B_ccv2.mxd SV3847

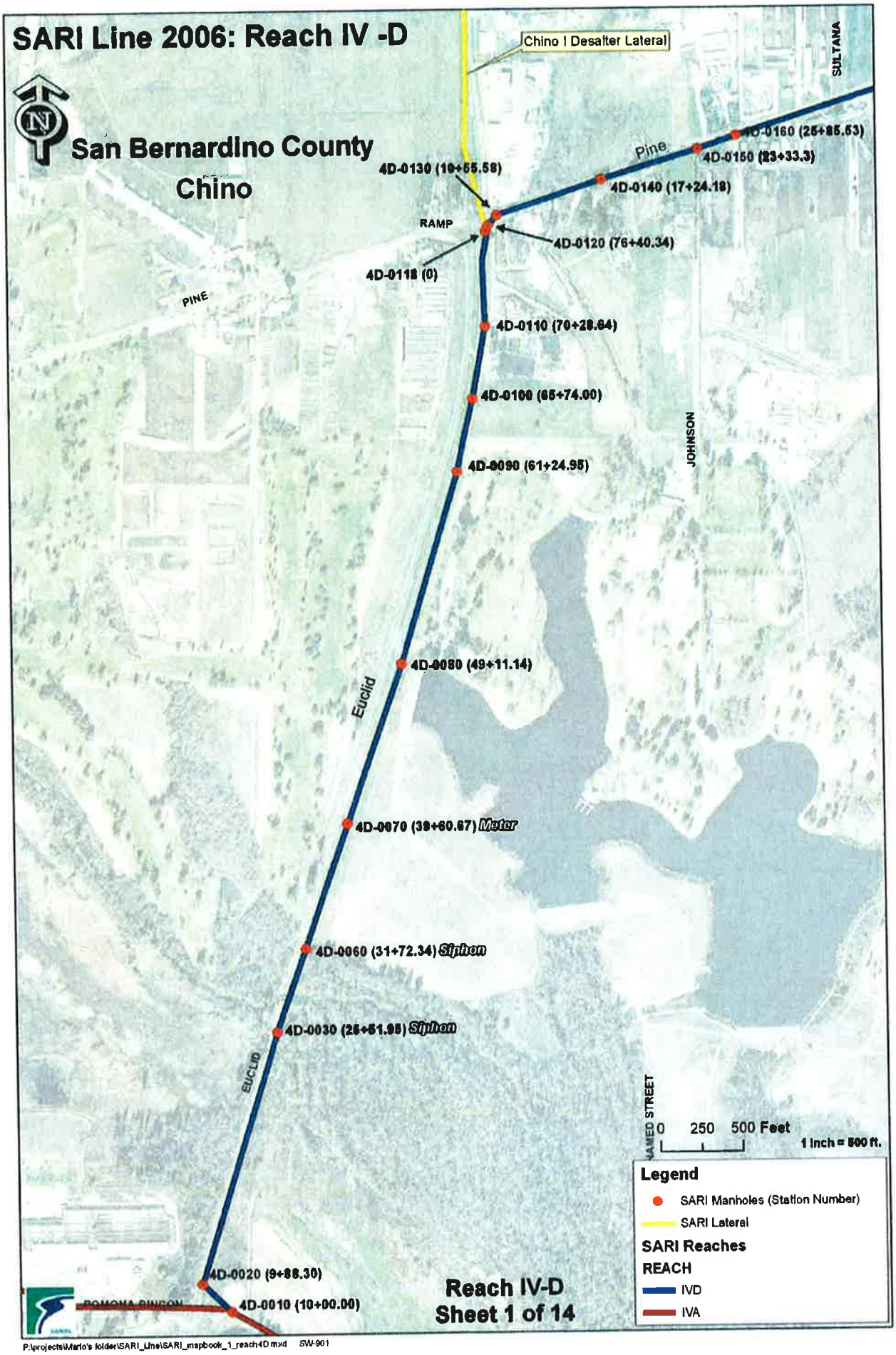

SARI Line 2006 : Reach IVB
Riverside County
Corona
RICHEY CITY
STATE HWY 91
Unincorporated Riverside County
Home Gardens
4B-0820 (256+50.00)
4B-0810 (226+50.00)
4B-0800 (218+50.00)
4B-0790 (208+00.00)
4B-0780 (191+00.00)
4B-0770 (187+50.00)
4B-0760 (182+00.00)
4B-0750 (178+00.00)
4B-0740 (174+50.00)
Reach IV-B
Sheet 6 of 7
Legend
SARI Manholes (Station Number)
SARI Reaches
IVB
0 250 500 Feet

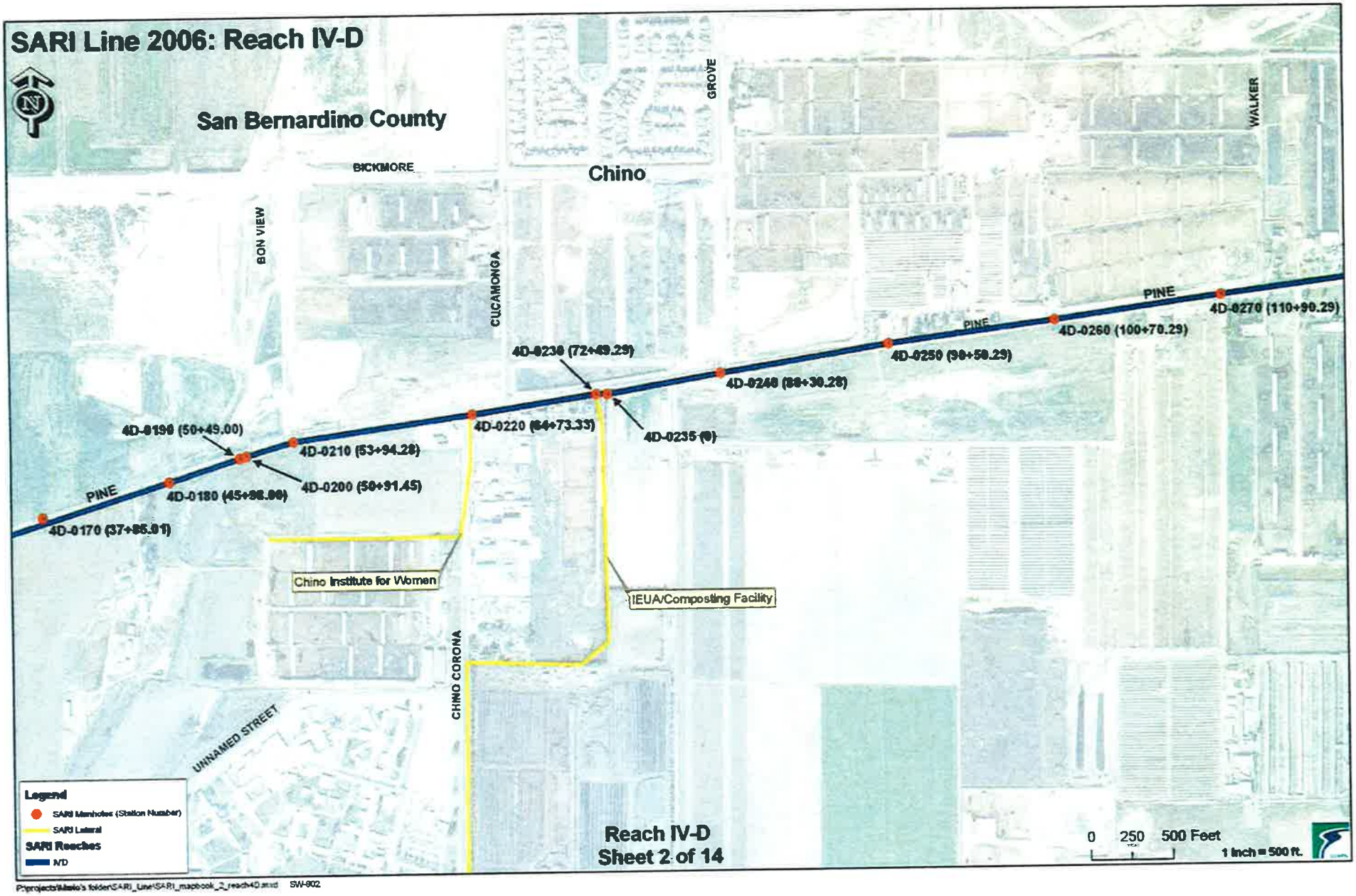


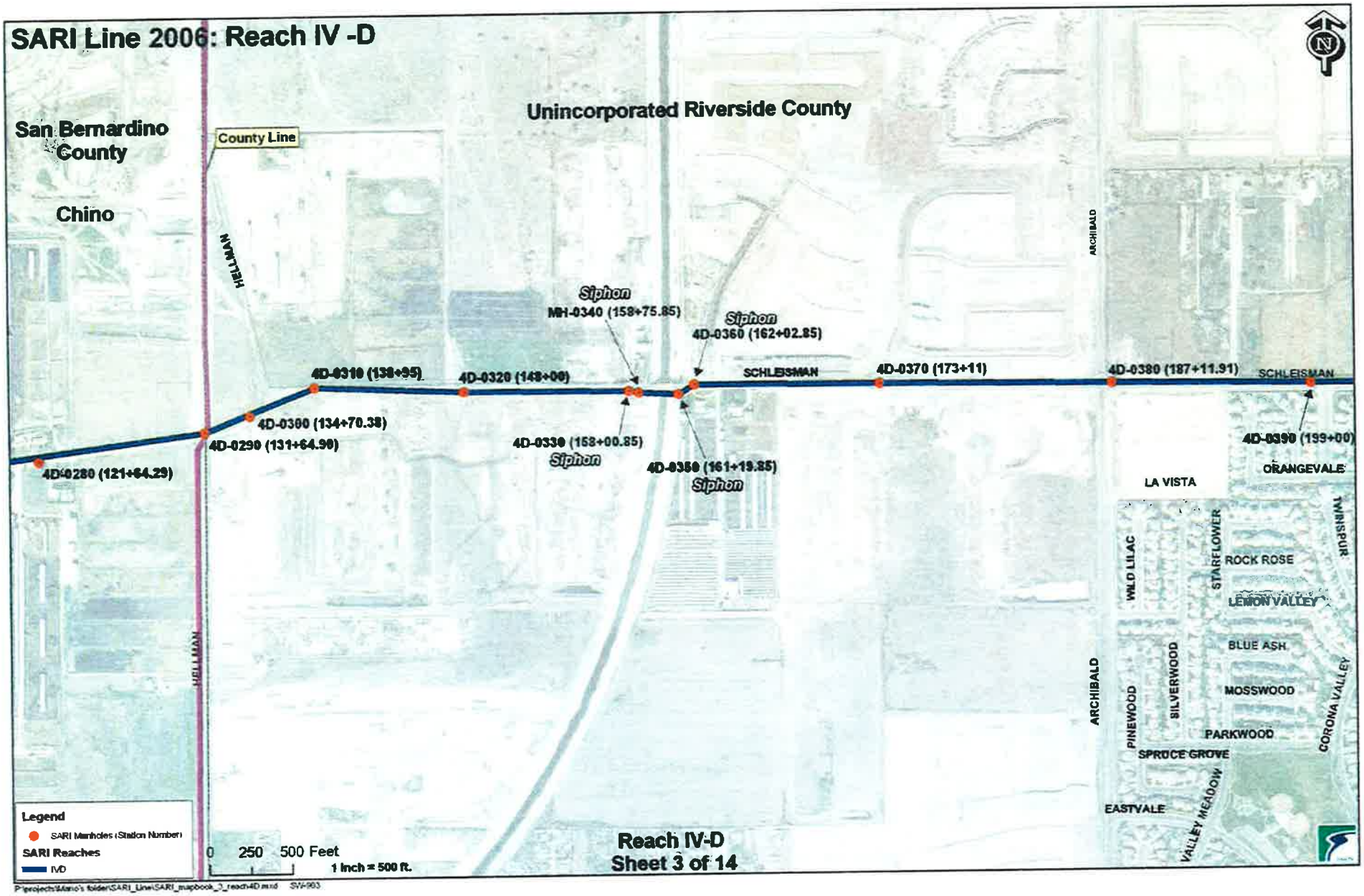
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_7_reach4B.mxd SW-888

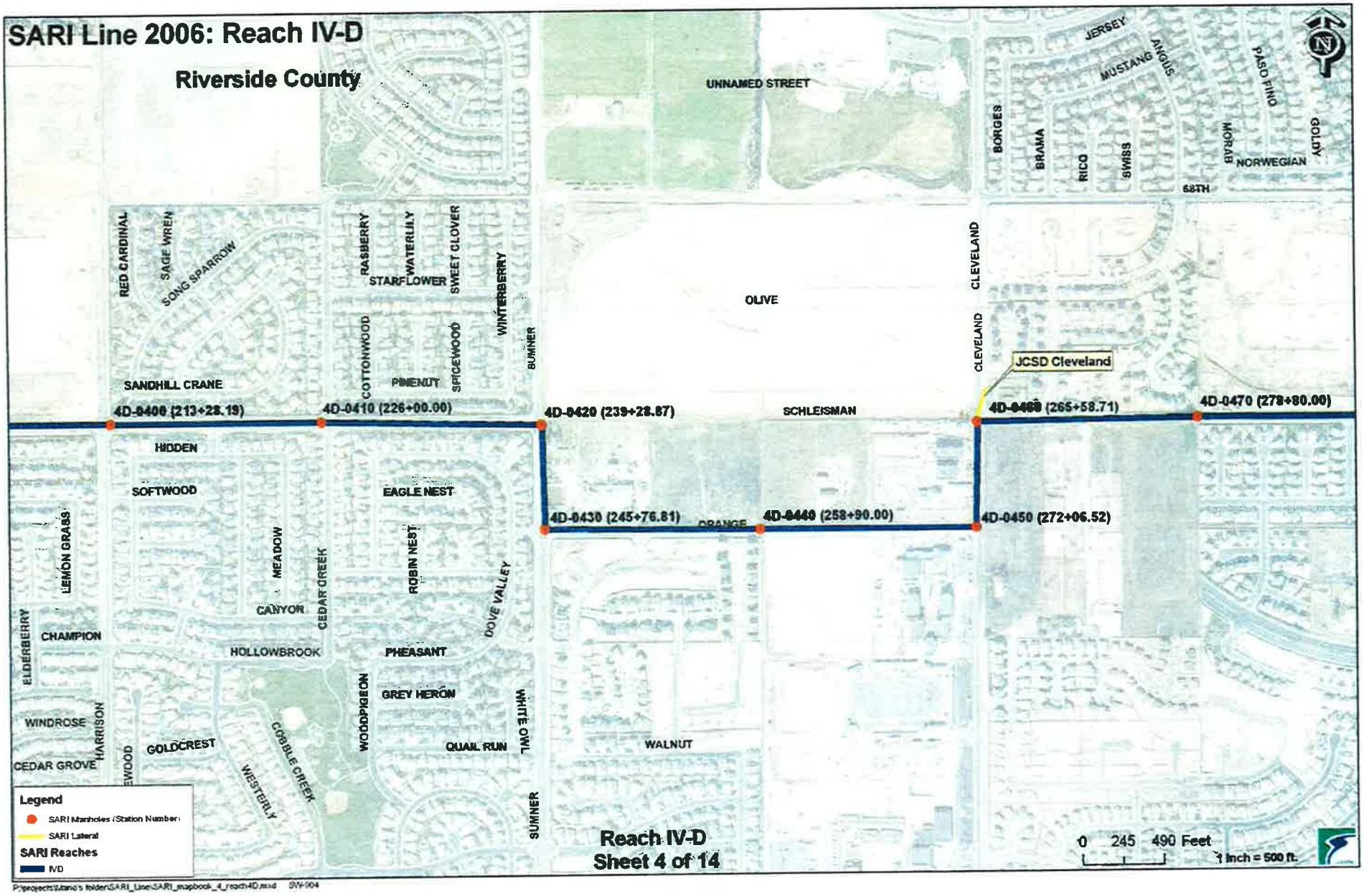
REACH

IV-D

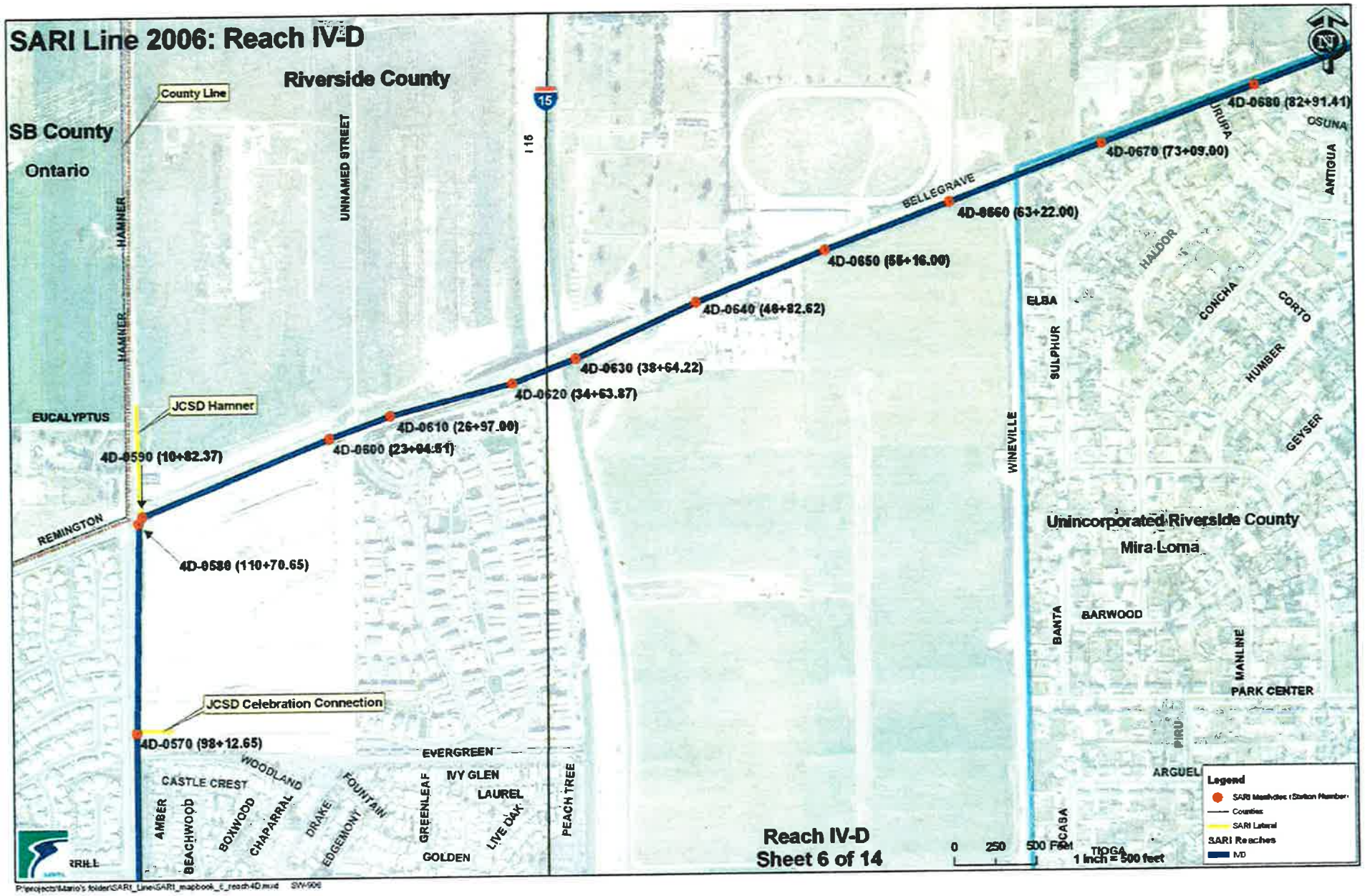

SARI Line 2006: Reach IV -D
San Bernardino County
Chino
Chino I Desalter Lateral
SULTANA
Pine
4D-0160 (25+85.53)
4D-0150 (23+33.3)
4D-0140 (17+24.18)
4D-0130 (10+55.58)
RAMP
4D-0120 (76+40.34)
4D-0118 (0)
PINE
4D-0110 (70+28.64)
4D-0100 (65+74.00)
JOHNSON
4D-0090 (61+24.95)
4D-0080 (49+11.14)
Euclid
4D-0070 (39+60.67) Meter
4D-0060 (31+72.34) Siphon
4D-0030 (26+51.95) Siphon
EUCLID
NAMED STREET
4D-0020 (9+88.30)
4D-0010 (10+00.00)
POMONA RINCON
0 250 500 Feet
1 inch = 500 ft.
Legend
SARI Manholes (Station Number)
SARI Lateral
SARI Reaches
REACH
IVD
IVA
Reach IV-D
Sheet 1 of 14
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_1_reach4D.mxd SW-901

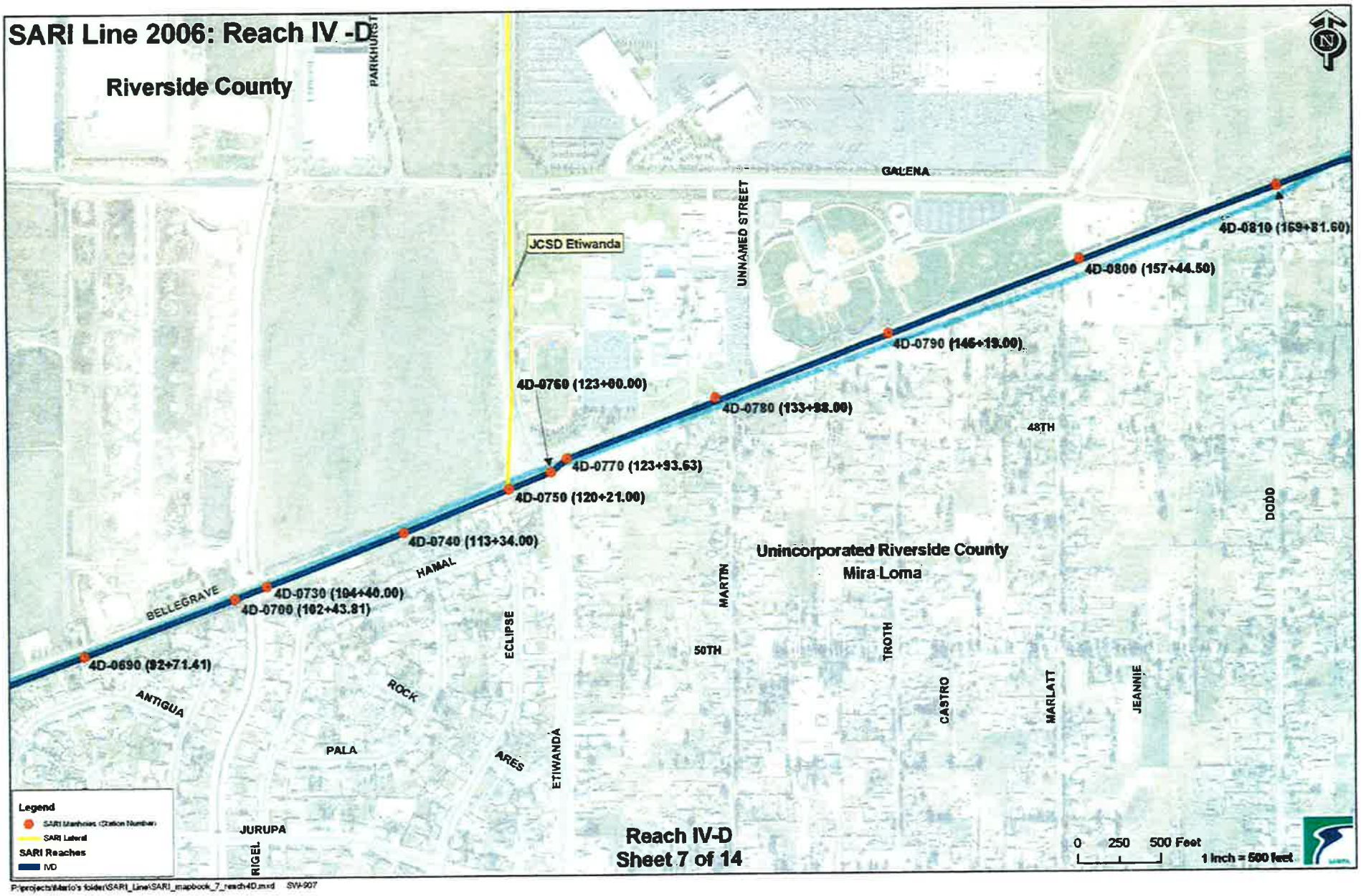

SARI Line 2006: Reach IV-D
San Bernardino County
Chino
BICKMORE
GROVE
WALKER
BON VIEW
CUCAMONGA
PINE
PINE
PINE
4D-0270 (110+90.29)
4D-0260 (100+70.29)
4D-0250 (90+50.29)
4D-0240 (80+30.28)
4D-0230 (72+49.29)
4D-0235 (0)
4D-0220 (64+73.33)
4D-0210 (53+94.28)
4D-0200 (50+91.45)
4D-0190 (50+49.00)
4D-0180 (45+98.00)
4D-0170 (37+85.01)
Chino Institute for Women
IEUA/Composting Facility
CHINO CORONA
UNNAMED STREET
Legend
SARI Manholes (Station Number)
SARI Lateral
SARI Reaches
IV/D
Reach IV-D
Sheet 2 of 14
0 250 500 Feet
1 Inch = 500 ft.
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_2_reach4D.mxd SW-902

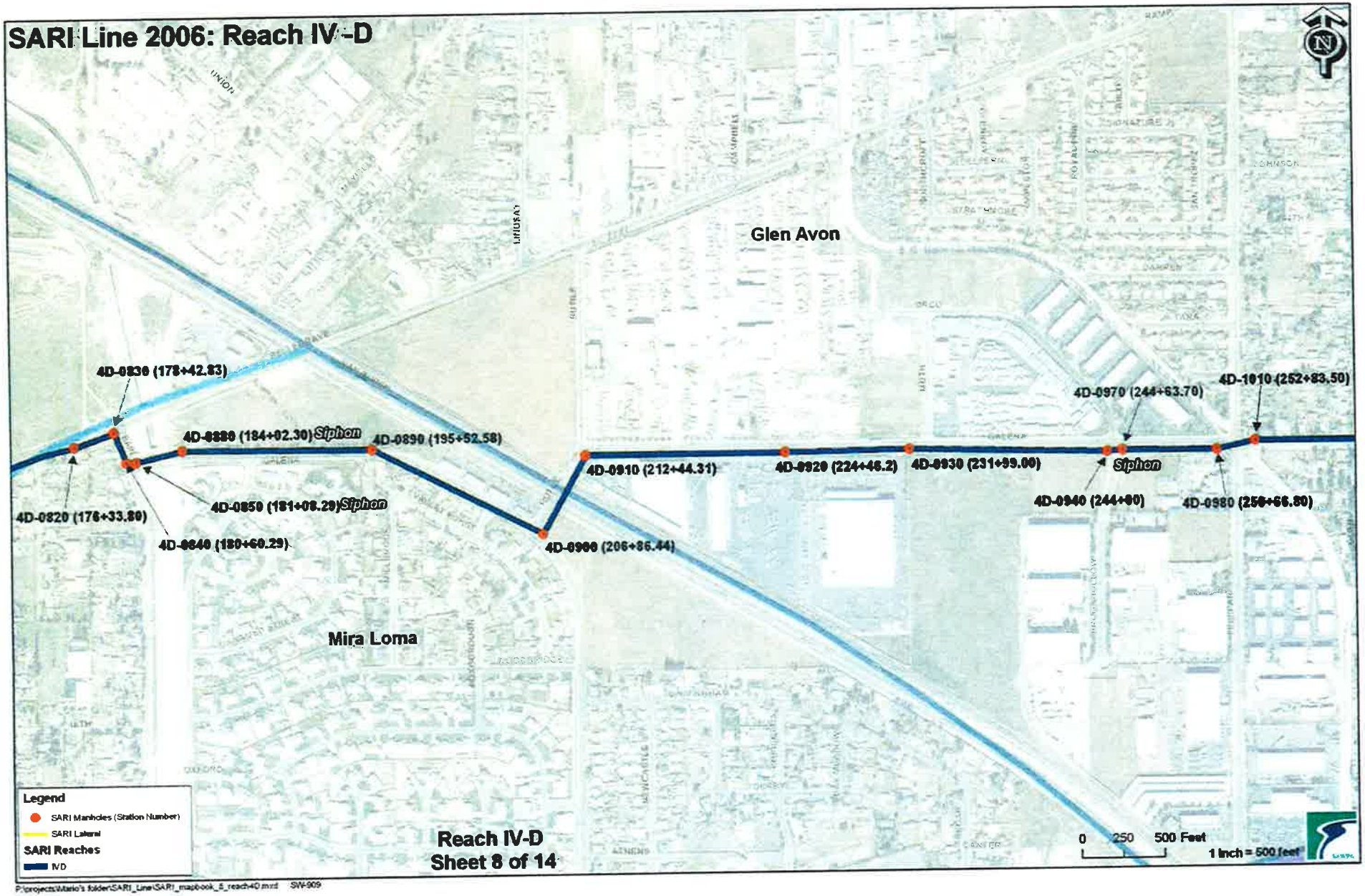

SARI Line 2006: Reach IV -D
Unincorporated Riverside County
San Bernardino County
Chino
County Line
HELLMAN
ARCHIBALD
Siphon
MH-0340 (158+75.85)
Siphon
4D-0360 (162+02.85)
4D-0310 (138+95)
4D-0320 (148+00)
SCHLEISMAN
4D-0370 (173+11)
4D-0380 (187+11.91)
SCHLEISMAN
4D-0390 (199+00)
4D-0300 (134+70.38)
4D-0290 (131+64.90)
4D-0280 (121+64.29)
4D-0330 (158+00.85)
Siphon
4D-0350 (161+19.85)
Siphon
LA VISTA
ORANGEVALE
WILD LILAC
STARFLOWER
ROCK ROSE
TWINSPUR
LEMON VALLEY
BLUE ASH
MOSSWOOD
PARKWOOD
SPRUCE GROVE
PINEWOOD
SILVERWOOD
CORONA VALLEY
VALLEY MEADOW
EASTVALE
Legend
SARI Manholes (Station Number)
SARI Reaches
IVD
0 250 500 Feet
1 Inch = 500 ft.
Reach IV-D
Sheet 3 of 14

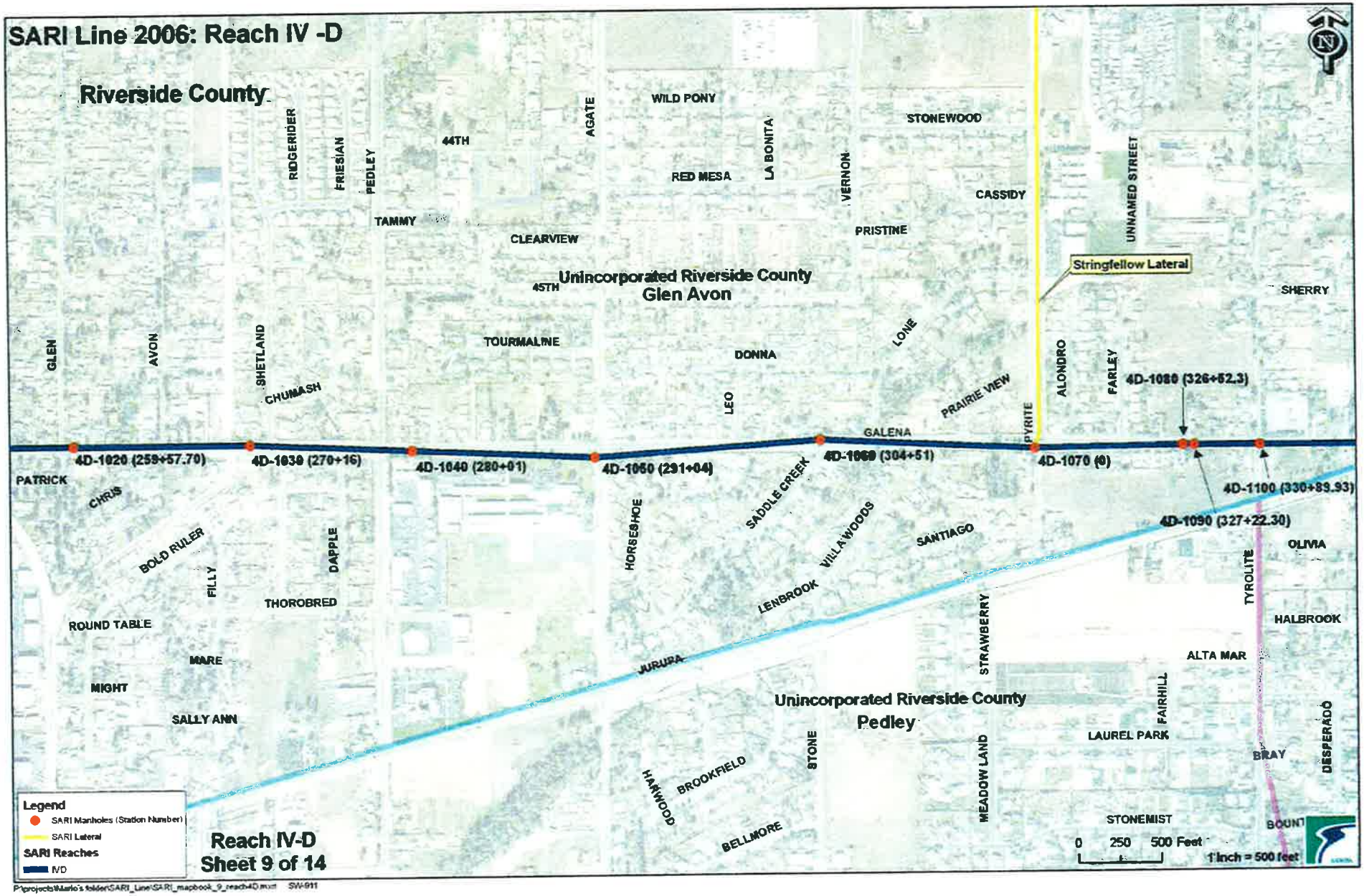

SARI Line 2006: Reach IV-D
Riverside County
UNNAMED STREET
JERSEY
MUSTANG
ANGUS
PASO FINO
GOLDY
BORGES
BRAHMA
RICO
SWISS
MORAB
NORWEGIAN
68TH
RED CARDINAL
SAGE WREN
SONG SPARROW
RASBERRY
WATERLILY
STARFLOWER
SWEET CLOVER
WINTERBERRY
COTTONWOOD
PINENUT
SPICEWOOD
SUMNER
OLIVE
CLEVELAND
CLEVELAND
JCSD Cleveland
SANDHILL CRANE
4D-0400 (213+28.19)
4D-0410 (226+00.00)
4D-0420 (239+28.87)
SCHLEISMAN
4D-0460 (265+58.71)
4D-0470 (279+80.00)
HIDDEN
SOFTWOOD
EAGLE NEST
4D-0430 (245+76.81)
ORANGE
4D-0440 (258+90.00)
4D-0450 (272+06.52)
LEMON GRASS
MEADOW
CEDAR CREEK
ROBIN NEST
DOVE VALLEY
CANYON
ELDERBERRY
CHAMPION
HOLLOWBROOK
PHEASANT
WOODPIGEON
GREY HERON
WHITE OWL
WINDROSE
HARRISON
GOLDCREST
COBBLE CREEK
QUAIL RUN
WALNUT
CEDAR GROVE
WESTERLY
Legend
SARI Manholes (Station Number)
SARI Lateral
SARI Reaches
IVD
Reach IV-D
Sheet 4 of 14
0 245 490 Feet
1 inch = 500 ft.
P:\projects\Diana's folder\SARI_Line\SARI_mapbook_4_reach4D.mxd SW-004

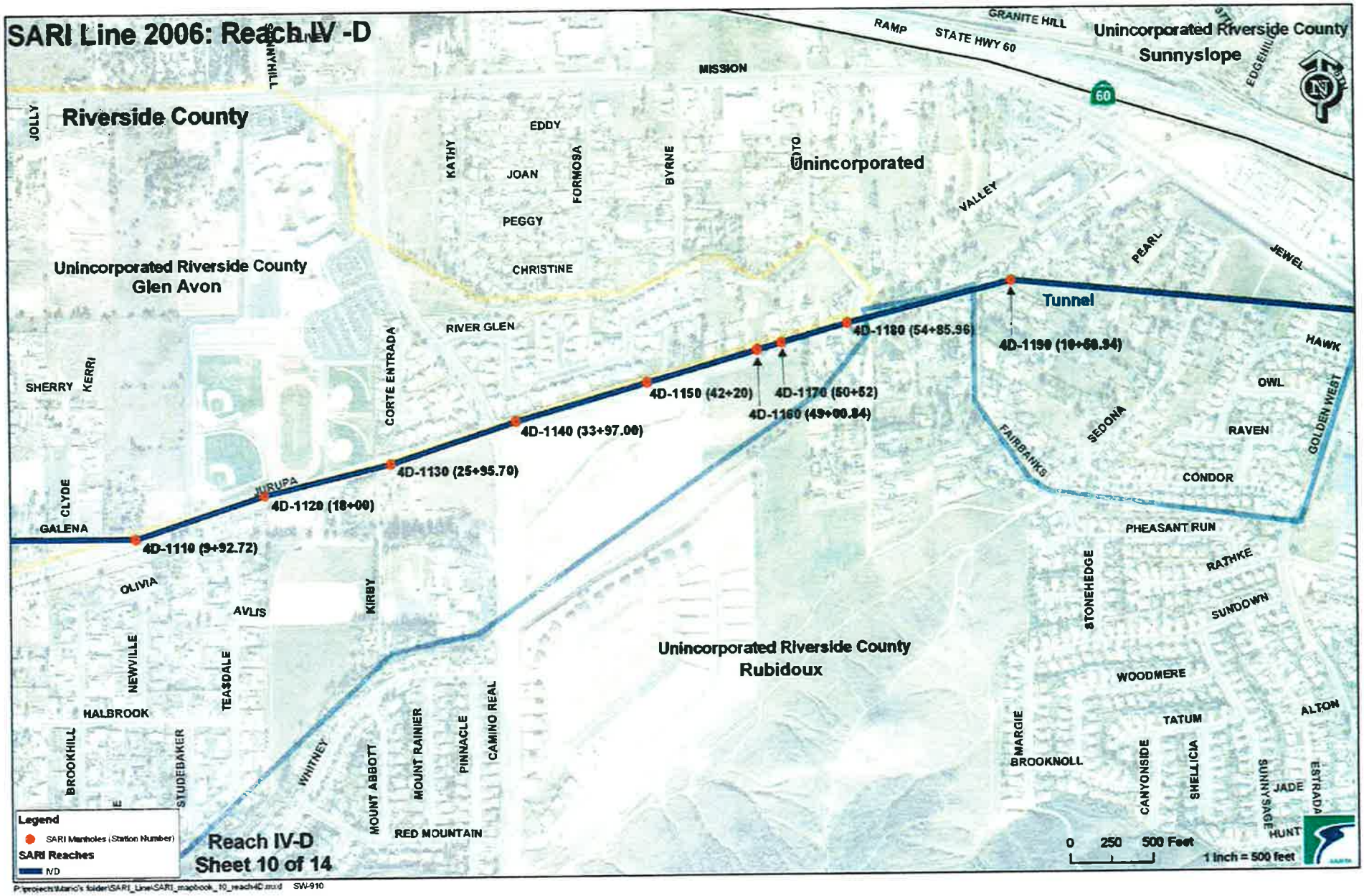

SARI Line 2006: Reach IV-D
Reach IV-D
Sheet 5 of 14
UNNAMED STREET
JCSD 56th Street Connection
Riverside County
4D-0560 (85+51.00)
4D-0550 (74+10.65)
4D-0540 (61+69.00)
4D-0530 (50+26.50)
4D-0520 (49+81.00)
4D-0510 (36+37.62)
4D-0500 (24+16.00)
4D-0490 (11+07.82)
4D-0480 (10+00.00)
4D-0470 (278+80.00)
CLOVERDALE
LIMONITE
OAKDALE
DANDELION
CARNATION
65TH
68TH
COOL SPRINGS
BLUE ROCK
LAKESHORE
DESERT SPRINGS
OLIVE
SCHLEISMAN
FEATHER
KAYAK
ROSEWOOD
ELMWOOD
PEPPERWOOD
OAK CREST
SWAN LAKE MOBILE HOME PARK
LARKDALE
SUNRISE
MONTE
PALM
ARBOR
MAYFAIR
DEL MAR
FAIRLANE
MAYBERRY
LAKEVIEW
PARK
115
RAMP
IRIS
HAMNER
LAVENDER
DAFFODIL
MARIGOLD
LILAC
HUNGARIAN
CASPIAN
JERSEY
ANGUS
MUSTANG
THOROUGHBRED
PASO FINO
SADDLEBRED
ICELANDIC
MORAB
GOLDY
NORWEGIAN
BRAMA
RICO
SWISS
WHITEWATER
ALPINE
LAKE SPRINGS
MOONRIVER
LINDSEY
KINGS RIVER
RIVERRUN
1 inch = 500 feet
0
280
560 Feet
Legend
SARI Manholes (Station Number)
SARI Lateral
SARI Reaches
IVD

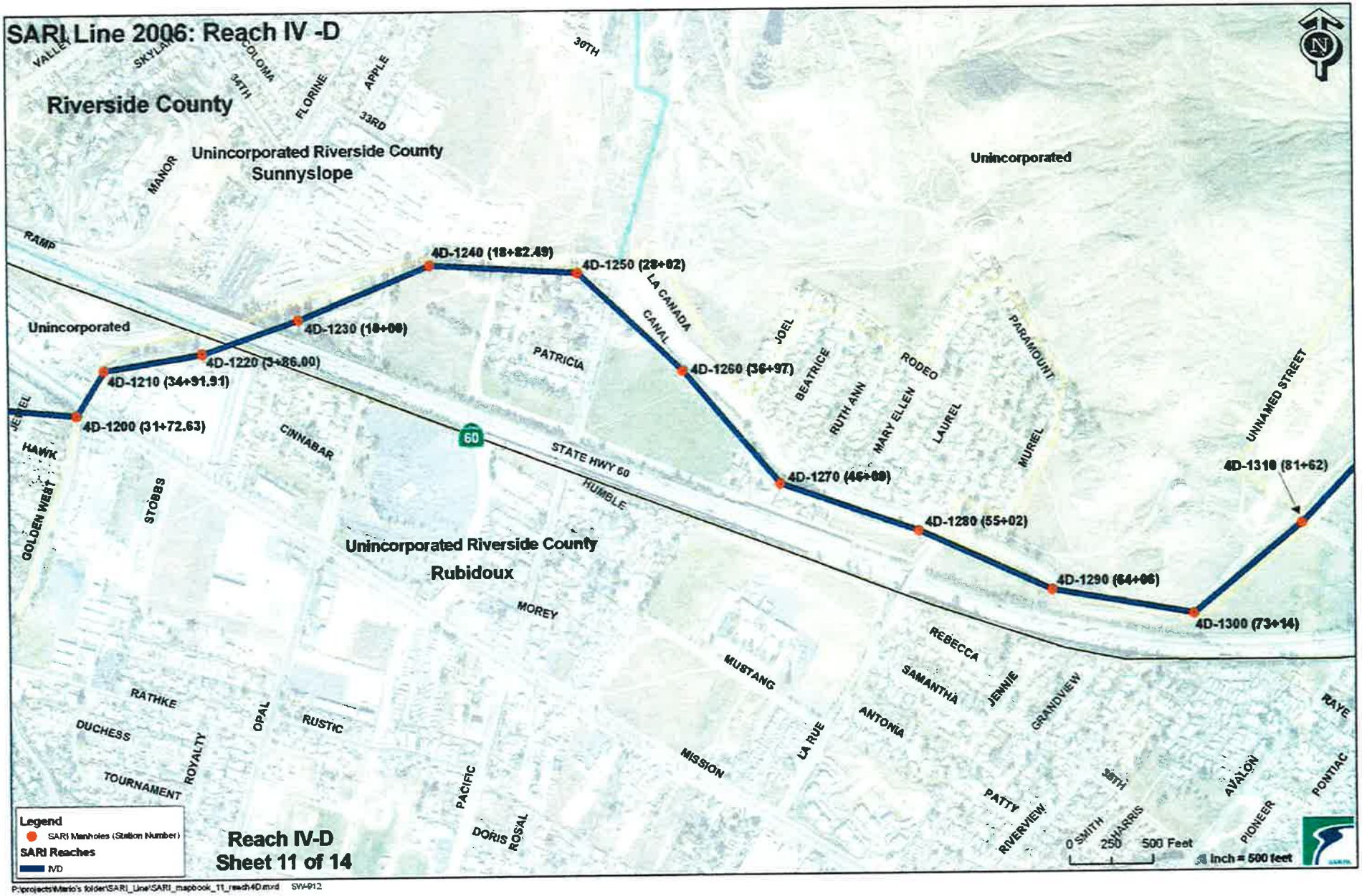

SARI Line 2006: Reach IV-D
Riverside County
SB County
Ontario
County Line
HAMNER
UNNAMED STREET
I 15
BELLEGRAVE
4D-0680 (82+91.41)
4D-0670 (73+09.00)
4D-0660 (63+22.00)
4D-0650 (55+16.00)
4D-0640 (46+82.62)
4D-0630 (38+64.22)
4D-0620 (34+63.87)
4D-0610 (26+97.00)
4D-0600 (23+04.81)
4D-0590 (10+82.37)
4D-0580 (110+70.65)
4D-0570 (98+12.65)
JCSD Hamner
JCSD Celebration Connection
EUCALYPTUS
REMINGTON
JURUPA
OSUNA
ANTIGUA
HALDOR
CONCHA
CORTO
HUMBER
GEYSER
ELSA
SULPHUR
WINEVILLE
Unincorporated Riverside County
Mira Loma
BARWOOD
BANTA
MAHLINE
PARK CENTER
PIRU
ARGUEL
TIOGA
EVERGREEN
IVY GLEN
LAUREL
LIVE OAK
PEACH TREE
GREENLEAF
GOLDEN
CASTLE CREST
WOODLAND
FOUNTAIN
DRAKE
EDGEMONT
CHAPARRAL
BOXWOOD
BEACHWOOD
AMBER
Reach IV-D
Sheet 6 of 14
0 250 500 Feet
1 inch = 500 feet
Legend
SARI Manholes (Station Number)
Counties
SARI Lateral
SARI Reaches
IVD
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_c_reach4D.mxd SW-906

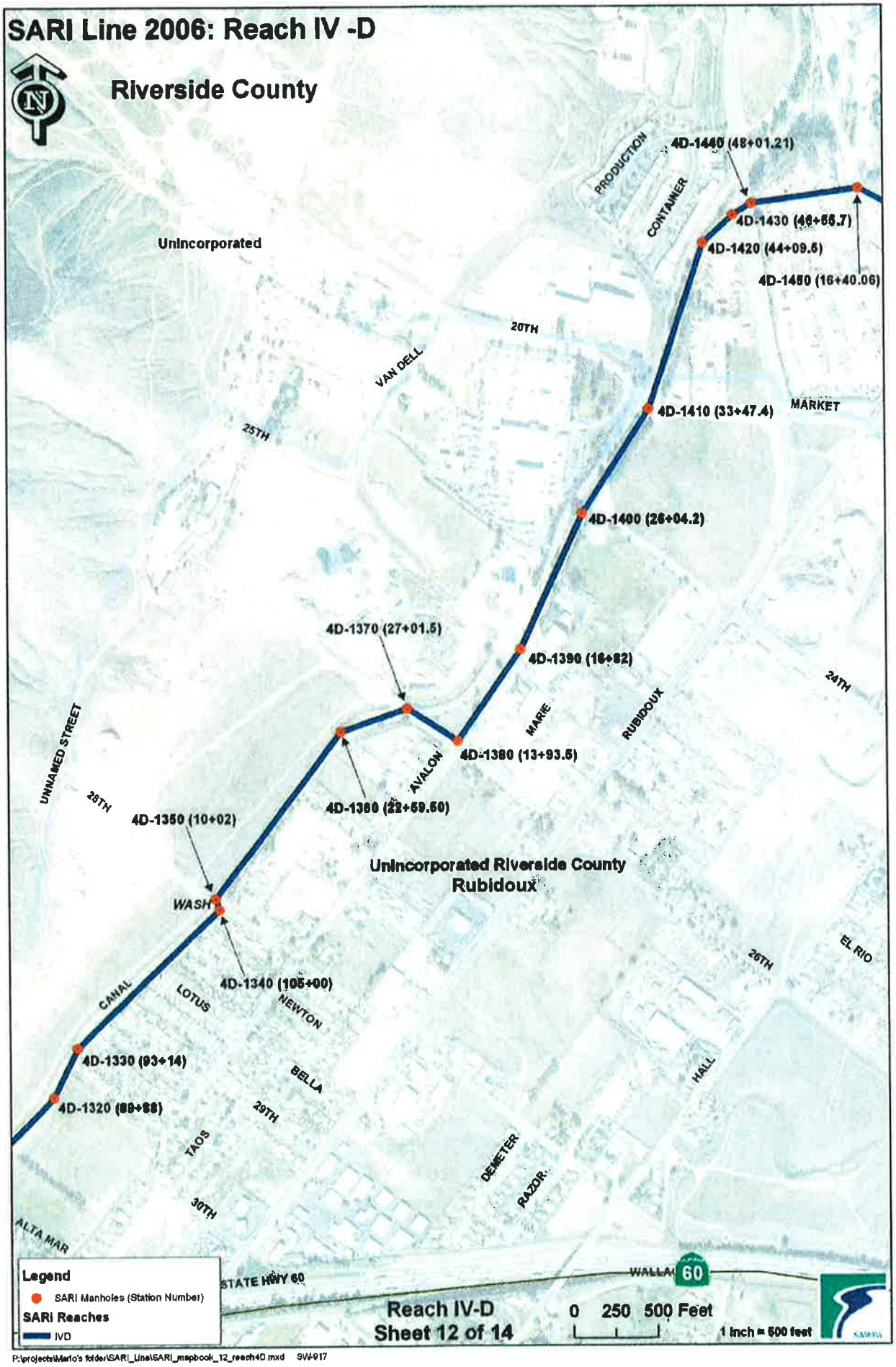

SARI Line 2006: Reach IV -D
Riverside County
PARKHURST
GALENA
UNNAMED STREET
JCSD Etiwanda
4D-0810 (169+81.60)
4D-0800 (157+44.50)
4D-0790 (146+19.00)
4D-0780 (133+88.00)
4D-0760 (123+60.00)
4D-0770 (123+93.63)
4D-0750 (120+21.00)
4D-0740 (113+34.00)
4D-0730 (104+40.00)
4D-0700 (102+43.81)
4D-0690 (92+71.41)
48TH
DODD
Unincorporated Riverside County
Mira Loma
HAMAL
BELLEGRAVE
MARTIN
ECLIPSE
50TH
TROTH
CASTRO
MARLATT
JEANNIE
ANTIGUA
ROCK
PALA
ARES
ETIWANDA
RIGEL
JURUPA
Legend
SARI Manholes (Station Number)
SARI Lateral
SARI Reaches
IVD
Reach IV-D
Sheet 7 of 14
0 250 500 Feet
1 inch = 500 feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_7_reach4D.mxd SW-907

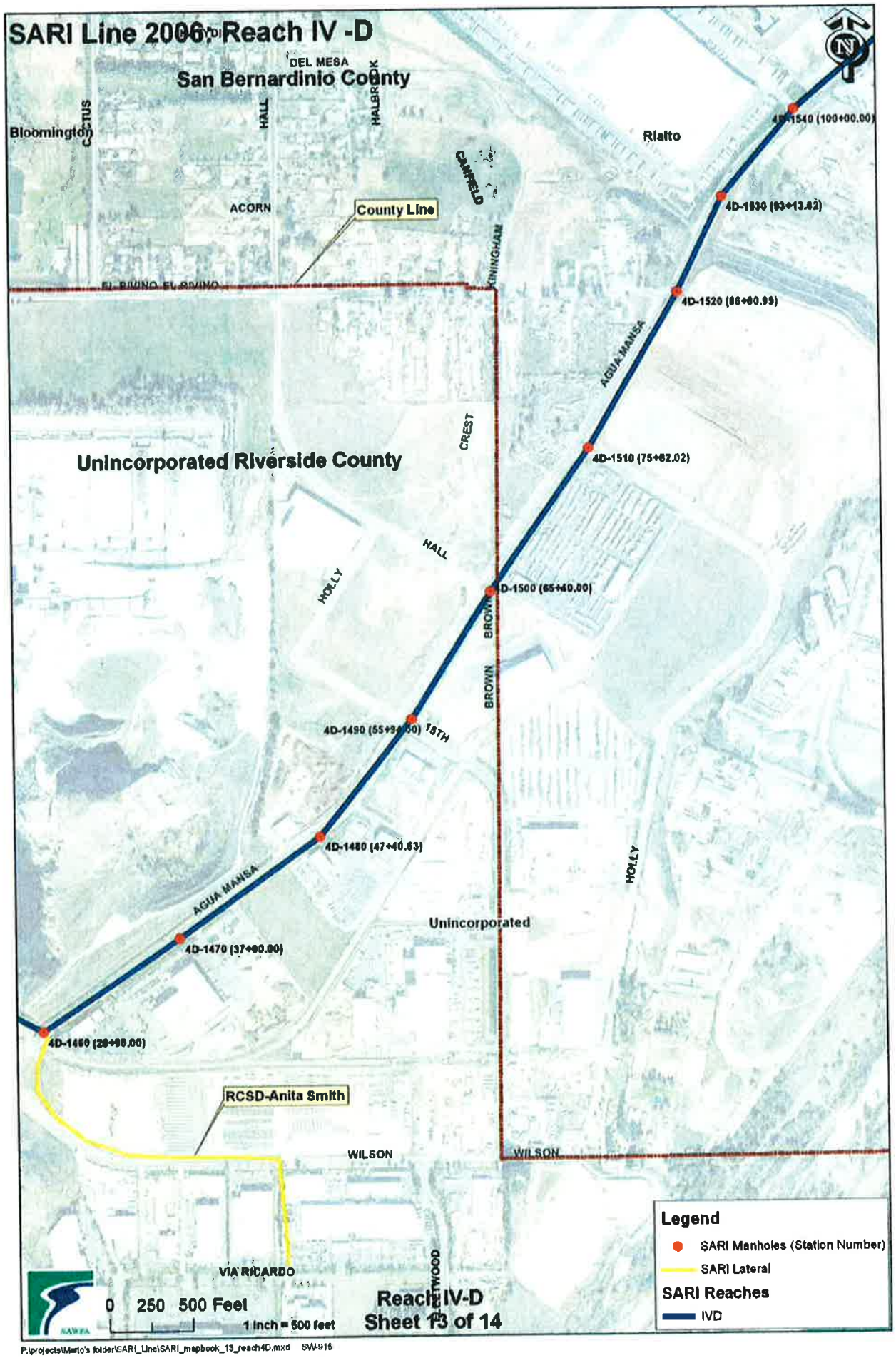

SARI Line 2006: Reach IV-D
Glen Avon
Mira Loma
4D-0820 (176+33.89)
4D-0830 (178+42.83)
4D-0840 (180+60.29)
4D-0850 (181+08.29) Siphon
4D-0880 (184+02.30) Siphon
4D-0890 (195+52.58)
4D-0900 (206+86.44)
4D-0910 (212+44.31)
4D-0920 (224+46.2)
4D-0930 (231+99.00)
4D-0940 (244+90)
Siphon
4D-0970 (244+63.70)
4D-0980 (256+66.80)
4D-1010 (252+83.50)
Legend
SARI Manholes (Station Number)
SARI Lateral
SARI Reaches
IVD
Reach IV-D
Sheet 8 of 14
0 250 500 Feet
1 Inch = 500 feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_8_reach40.mxd SW-909


SARI Line 2006: Reach IV -D
Riverside County
RIDGERIDER
FRIESIAN
PEDLEY
44TH
AGATE
WILD PONY
LA BONITA
VERNON
STONEWOOD
RED MESA
CASSIDY
UNNAMED STREET
TAMMY
CLEARVIEW
PRISTINE
Stringfellow Lateral
45TH
Unincorporated Riverside County
Glen Avon
SHERRY
GLEN
AVON
SHETLAND
TOURMALINE
DONNA
LONE
ALONDRO
FARLEY
4D-1080 (326+52.3)
CHUMASH
LEO
PRAIRIE VIEW
PYRITE
GALENA
4D-1020 (259+57.70)
4D-1030 (270+16)
4D-1040 (280+01)
4D-1050 (291+04)
4D-1060 (304+51)
4D-1070 (0)
4D-1100 (330+89.93)
PATRICK
CHRIS
SADDLE CREEK
4D-1090 (327+22.30)
BOLD RULER
DAPPLE
HORSESHOE
VILLAWOODS
SANTIAGO
OLIVIA
FILLY
THOROBRED
LENBROOK
TYROLITE
HALBROOK
ROUND TABLE
STRAWBERRY
MARE
JURUPA
ALTA MAR
MIGHT
Unincorporated Riverside County
Pedley
FAIRHILL
SALLY ANN
LAUREL PARK
BRAY
DESPERADO
HANWOOD
BROOKFIELD
STONE
MEADOW LAND
BELLMORE
STONEMIST
Legend
SARI Manholes (Station Number)
SARI Lateral
SARI Reaches
IVD
Reach IV-D
Sheet 9 of 14
0 250 500 Feet
1 inch = 500 feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_9_reach4D.mxd SW-911

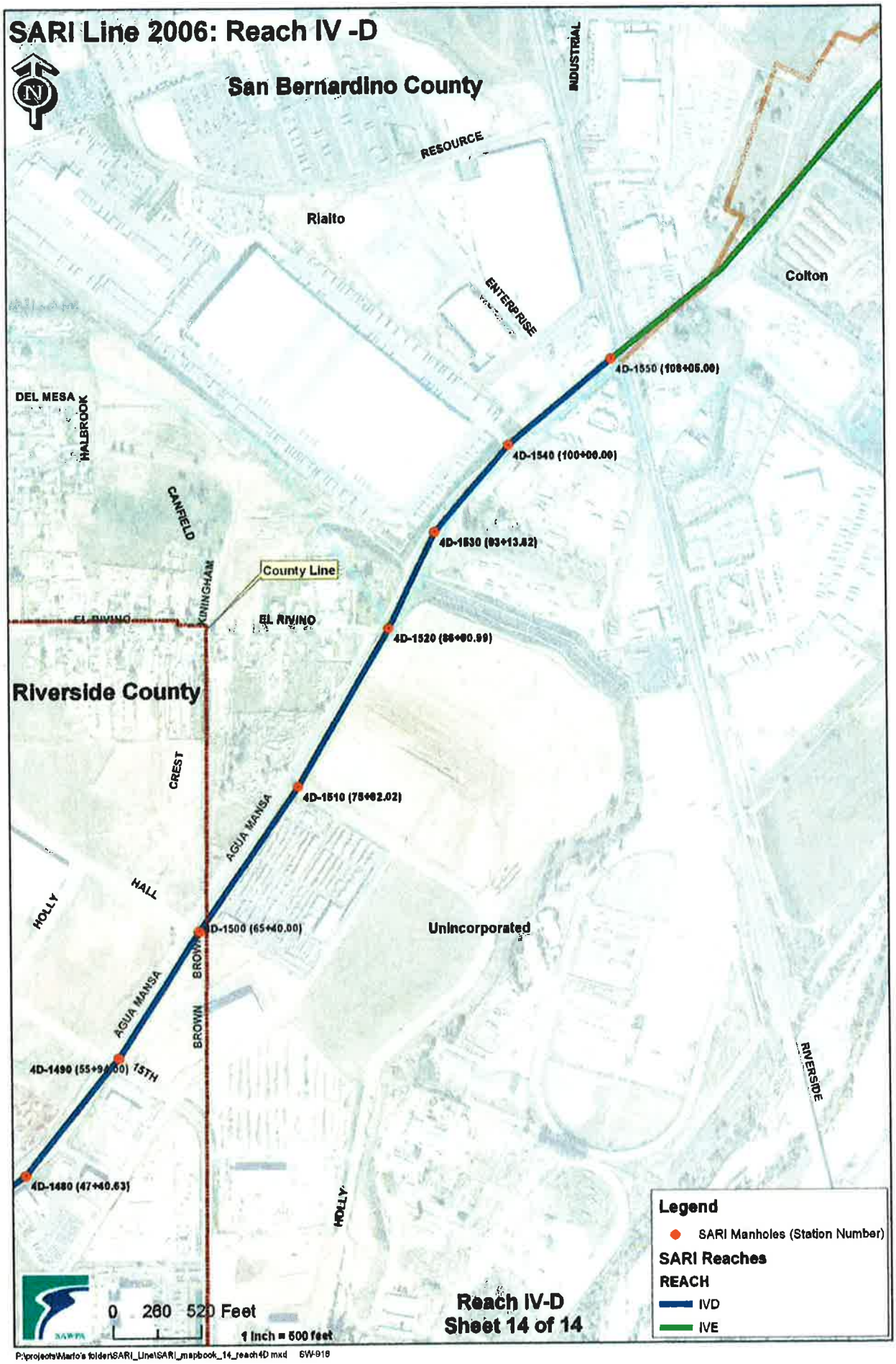

SARI Line 2006: Reach IV -D
Riverside County
Unincorporated Riverside County
Glen Avon
Unincorporated Riverside County
Sunnyslope
Unincorporated
Unincorporated Riverside County
Rubidoux
Tunnel
4D-1110 (9+92.72)
4D-1120 (18+00)
4D-1130 (25+95.70)
4D-1140 (33+97.00)
4D-1150 (42+20)
4D-1160 (49+00.84)
4D-1170 (50+52)
4D-1180 (54+85.96)
4D-1190 (10+60.34)
MISSION
GRANITE HILL
RAMP
STATE HWY 60
EDGEHILL
JOLLY
EDDY
KATHY
JOAN
FORMOSA
BYRNE
PEGGY
CHRISTINE
VALLEY
PEARL
JEWEL
RIVER GLEN
CORTE ENTRADA
SHERRY
KERRI
HAWK
OWL
SEDONA
RAVEN
GOLDEN WEST
FAIRBANKS
CONDOR
PHEASANT RUN
RATHKE
SUNDOWN
STONEHEDGE
WOODMERE
TATUM
ALTON
JADE
ESTRADA
SUNNYSAGE
HUNT
MARGIE
BROOKNOLL
CANYONSIDE
SHELLICIA
CLYDE
GALENA
JURUPA
OLIVIA
AVLIS
KIRBY
NEWVILLE
TEASDALE
HALBROOK
BROOKHILL
STUDEBAKER
WHITNEY
MOUNT ABBOTT
MOUNT RAINIER
PINNACLE
CAMINO REAL
RED MOUNTAIN
Legend
SARI Manholes (Station Number)
SARI Reaches
IV-D
Reach IV-D
Sheet 10 of 14
0 250 500 Feet
1 inch = 500 feet
P:\projects\Marci's folder\SARI_Line\SARI_mapbook_10_reach4D.mxd SW-910


SARI Line 2006: Reach IV -D
Riverside County
Unincorporated Riverside County
Sunnyslope
Unincorporated
Unincorporated
Unincorporated Riverside County
Rubidoux
4D-1200 (31+72.63)
4D-1210 (34+91.91)
4D-1220 (3+86.00)
4D-1230 (18+00)
4D-1240 (18+82.49)
4D-1250 (28+02)
4D-1260 (36+97)
4D-1270 (46+00)
4D-1280 (55+02)
4D-1290 (64+06)
4D-1300 (73+14)
4D-1310 (81+62)
STATE HWY 60
60
CANAL
LA CANADA
PATRICIA
JOEL
BEATRICE
RUTH ANN
MARY ELLEN
RODEO
LAUREL
PARAMOUNT
MURIEL
UNNAMED STREET
CINNABAR
HUMBLE
HAWK
GOLDEN WEST
STOBBS
MOREY
REBECCA
MUSTANG
SAMANTHA
JENNIE
GRANDVIEW
ANTONIA
LA RUE
MISSION
PACIFIC
DORIS ROSAL
RATHKE
DUCHESS
TOURNAMENT
ROYALTY
OPAL
RUSTIC
PATTY
RIVERVIEW
SMITH
HARRIS
AVALON
PIONEER
PONTIAC
RAYE
30TH
34TH
33RD
FLORINE
APPLE
COLOMA
MANOR
RAMP
Legend
SARI Manholes (Station Number)
SARI Reaches
IVD
Reach IV-D
Sheet 11 of 14
0 250 500 Feet
1 inch = 500 feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_11_reach4D.mxd SW-912


SARI Line 2006: Reach IV -D
Riverside County
Unincorporated
4D-1440 (48+01.21)
4D-1430 (46+55.7)
4D-1420 (44+09.5)
4D-1450 (16+40.06)
4D-1410 (33+47.4)
4D-1400 (26+04.2)
4D-1390 (16+82)
4D-1370 (27+01.5)
4D-1380 (13+93.5)
4D-1360 (22+59.50)
4D-1350 (10+02)
4D-1340 (105+00)
4D-1330 (93+14)
4D-1320 (89+88)
PRODUCTION
CONTAINER
20TH
VAN DELL
25TH
MARKET
24TH
MARIE
RUBIDOUX
AVALON
UNNAMED STREET
28TH
WASH
Unincorporated Riverside County
Rubidoux
26TH
EL RIO
CANAL
LOTUS
NEWTON
BELLA
29TH
HALL
TAOS
DEMETER
RAZOR
30TH
ALTA MAR
STATE HWY 60
60
Legend
SARI Manholes (Station Number)
SARI Reaches
IVD
Reach IV-D
Sheet 12 of 14
0 250 500 Feet
1 inch = 500 feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_12_reach4D.mxd SW-917



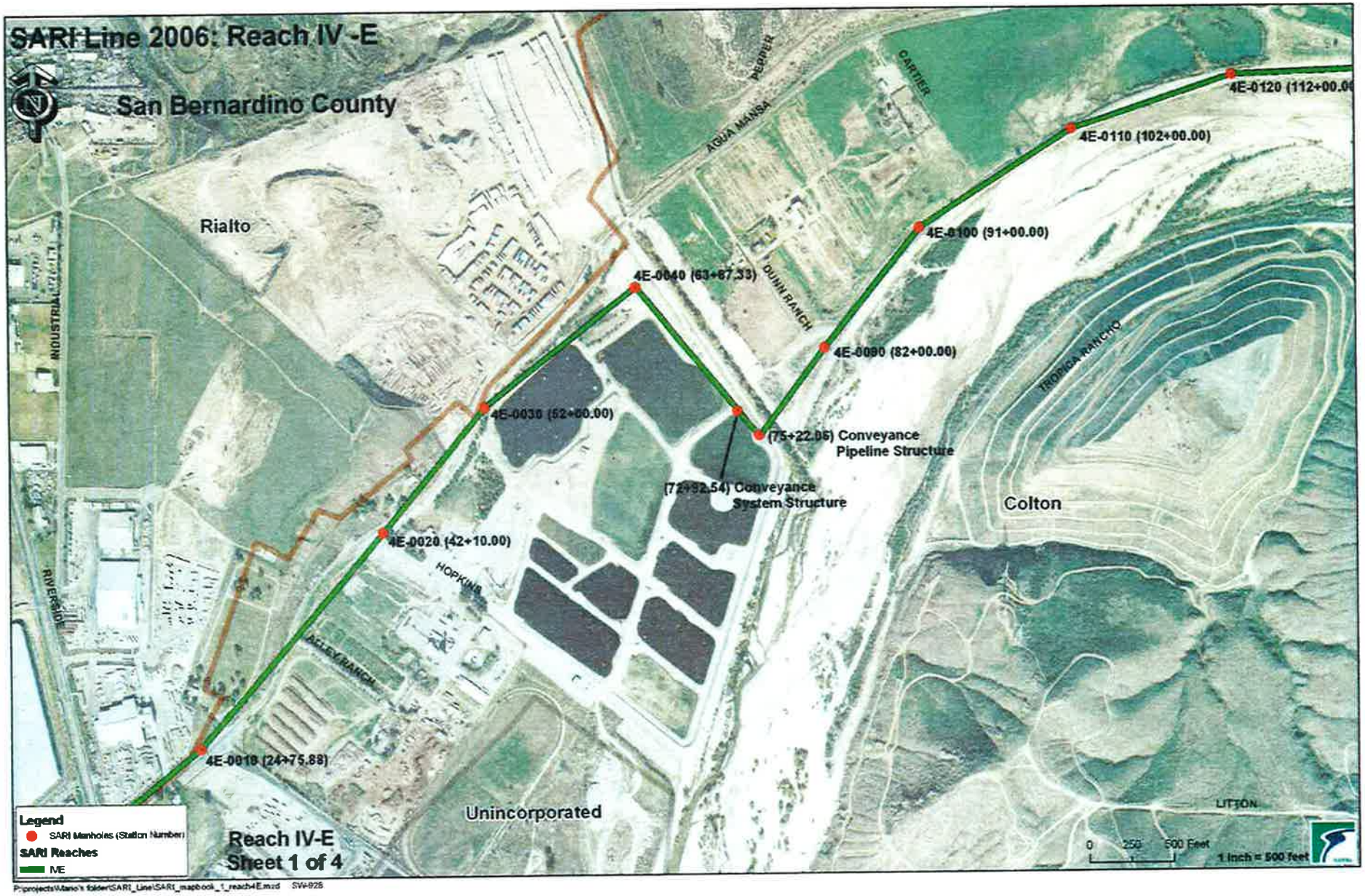
P:\projects\Marlo's folder\SARI_Line\SARI_mapbook_13_reach4D.mxd SVI-916

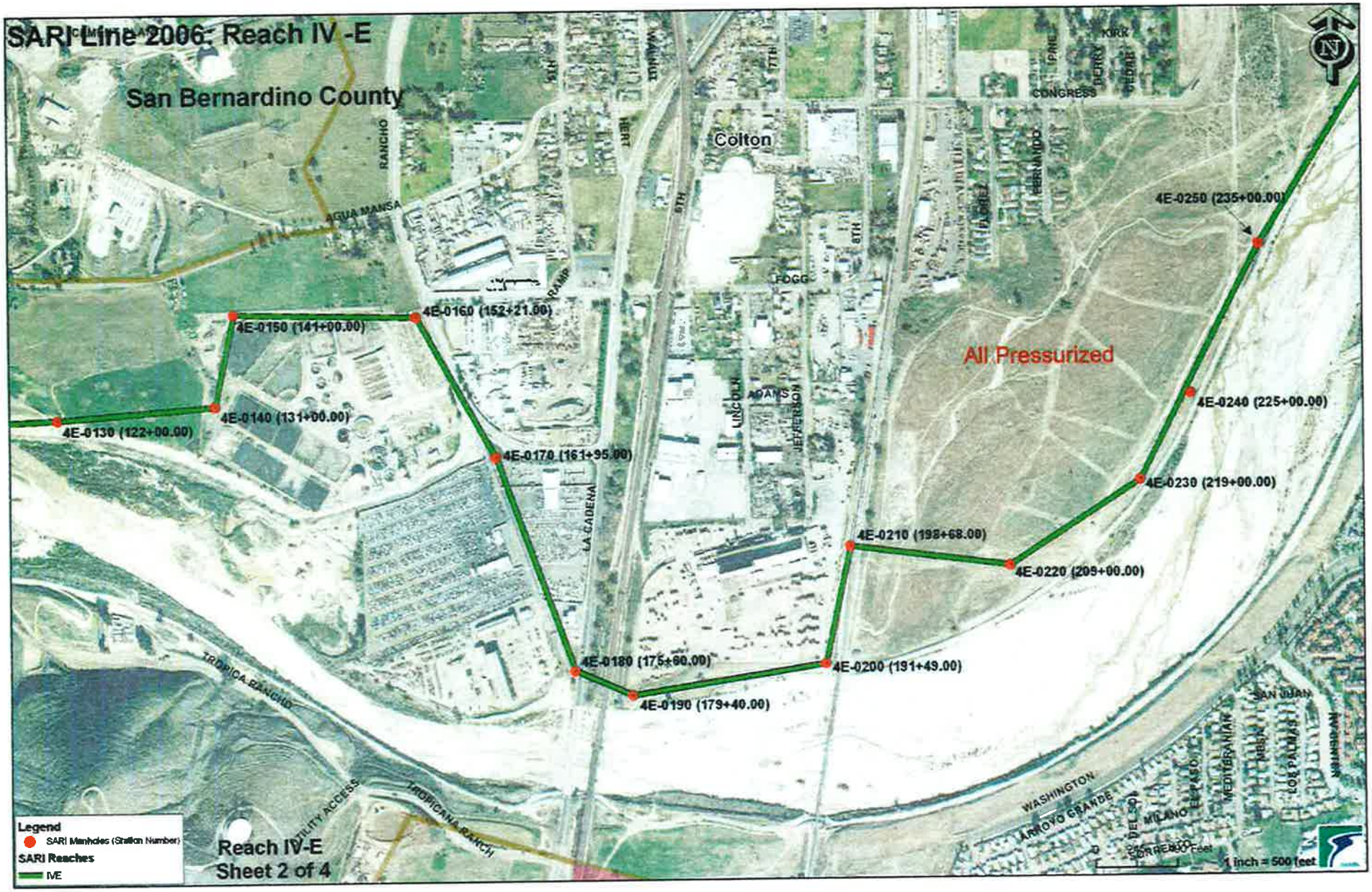


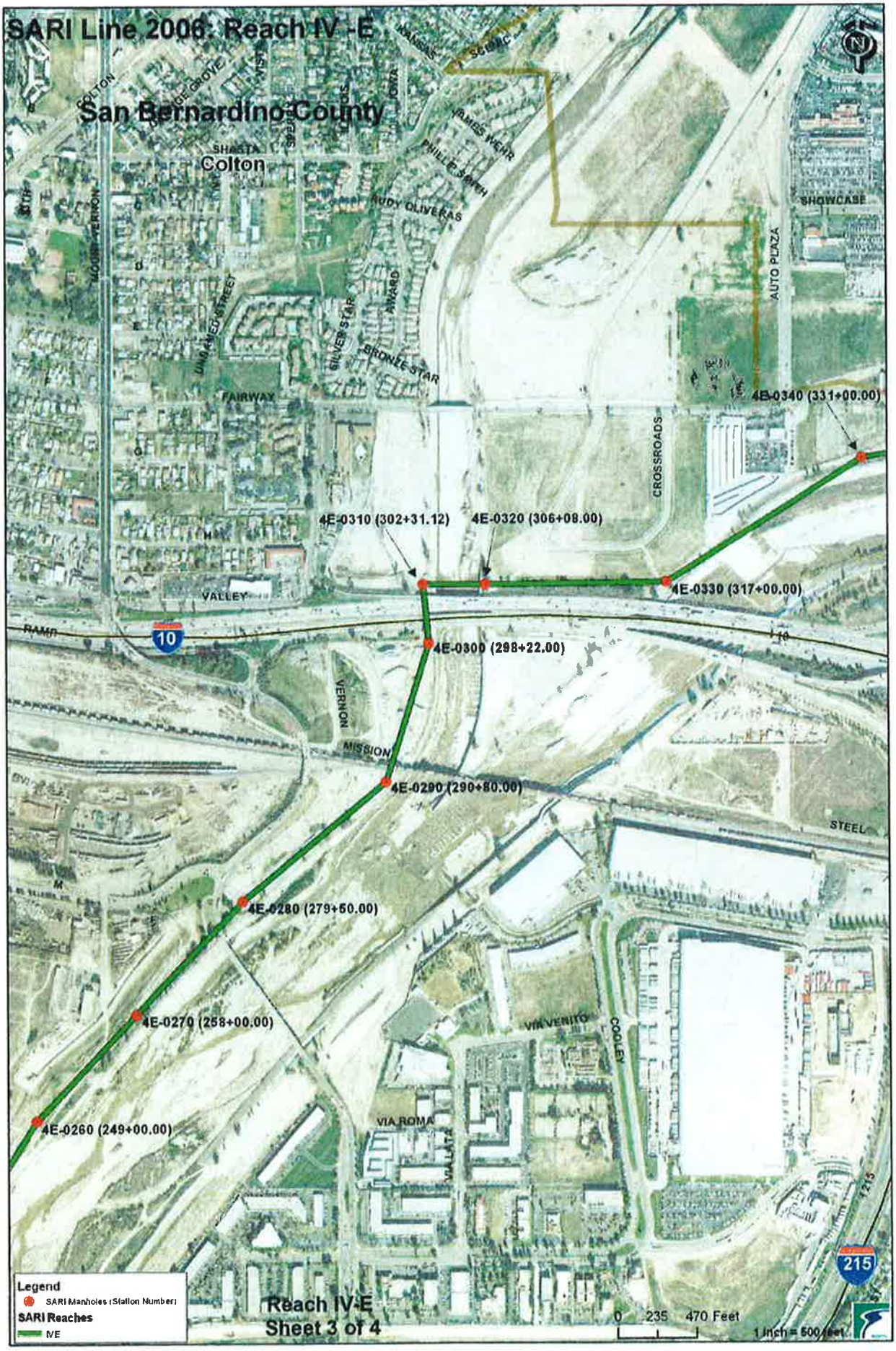
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_14_reach4D.mxd SW-918

REACH

IV-E


SARI Line 2006: Reach IV -E
San Bernardino County
Rialto
Colton
Unincorporated
AGUA MANSA
PEPPER
CARTIER
DUNN RANCH
TROPICA RANCHO
INDUSTRIAL
RIVERSIDE
HOPKINS
ALLEY RANCH
LITTON
4E-0120 (112+00.00)
4E-0110 (102+00.00)
4E-0100 (91+00.00)
4E-0090 (82+00.00)
4E-0040 (63+87.33)
4E-0030 (52+00.00)
4E-0020 (42+10.00)
4E-0010 (24+75.88)
(75+22.06) Conveyance Pipeline Structure
(72+52.54) Conveyance System Structure
Legend
SARI Manholes (Station Number)
SARI Reaches
IVE
Reach IV-E
Sheet 1 of 4
0 250 500 Feet
1 inch = 500 feet
P:\projects\Wano's folder\SARI_Line\SARI_mapbook_1_reach4E.mxd SVI-925


SARI Line 2006: Reach IV -E
San Bernardino County
Colton
All Pressurized
4E-0130 (122+00.00)
4E-0140 (131+00.00)
4E-0150 (141+00.00)
4E-0160 (152+21.00)
4E-0170 (161+95.00)
4E-0180 (175+60.00)
4E-0190 (179+40.00)
4E-0200 (191+49.00)
4E-0210 (198+68.00)
4E-0220 (209+00.00)
4E-0230 (219+00.00)
4E-0240 (225+00.00)
4E-0250 (235+00.00)
AGUA MANSA
RANCHO
HERT
WARM CRK
5TH
6TH
7TH
8TH
FOGG
LINCOLN
ADAMS
JEFFERSON
LA CADENA
CONGRESS
KIRK
PINE
DERRY
CEDAR
ALABAMA
FERNANDO
TROPICA RANCH
TROPICANA RANCH
UTILITY ACCESS
WASHINGTON
ARROYO GRANDE
DELSO
MILANO
MEDITERRANIAN
SAN JUAN
LOS PALMAS
Legend
SARI Manholes (Station Number)
SARI Reaches
IVE
Reach IV-E
Sheet 2 of 4
0
250
500 Feet
1 inch = 500 feet

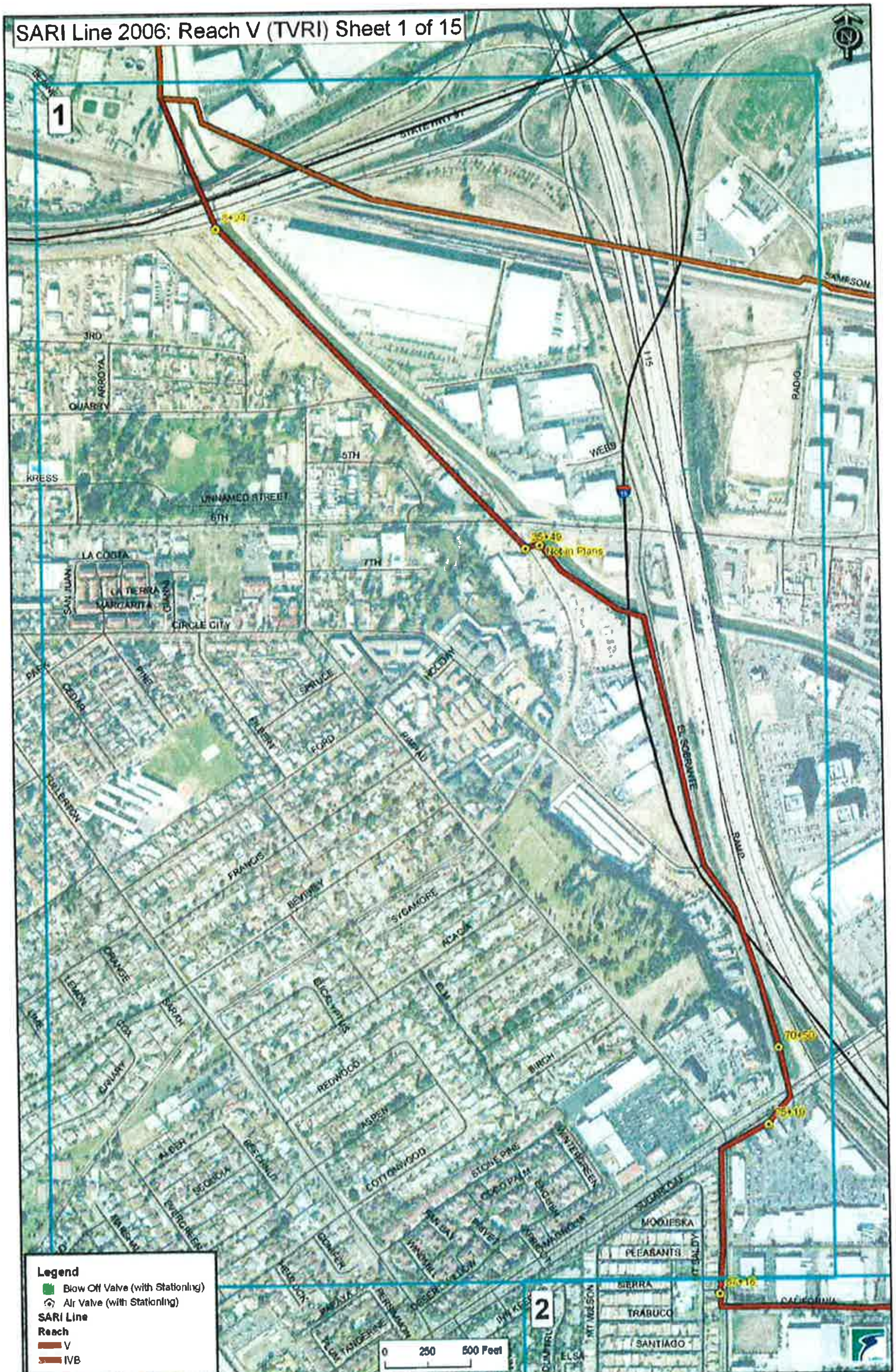

SARI Line 2006: Reach IV -E
San Bernardino County
Colton
4E-0340 (331+00.00)
4E-0330 (317+00.00)
4E-0320 (306+08.00)
4E-0310 (302+31.12)
4E-0300 (298+22.00)
4E-0290 (290+80.00)
4E-0280 (279+50.00)
4E-0270 (258+00.00)
4E-0260 (249+00.00)
Legend
SARI Manholes (Station Number)
SARI Reaches
IVE
Reach IV-E
Sheet 3 of 4
0 235 470 Feet
1 inch = 500 feet


SARI Line 2006: Reach IV -E
San Bernardino County
INLAND
HILLCREST
ARROWHEAD
SIERRA
WASHINGTON
ENNIS
ORANGE SHOW
AMOS
DUMAS
CHANDLER
AUTO PLAZA
CENTURY
AUTO CENTER
SHOWCASE
CAMINO REAL
215
4E-0390 (371+01.00)
MACKAY
4E-0380 (357+55.00)
4E-0350 (337+93.00)
4E-0370 (348+37.00)
4E-0360 (339+64.00)
AIRPORT
UNNAMED STREET
HOSPITALITY
DINERS
HUNTS
SUNWEST
Colton
E
10
REDLANDS
CONCOURSE
STEEL
OLIVER HOLMES
Legend
SARI Manholes (Station Number)
SARI Reaches
IVE
Reach IV-E
Sheet 4 of 4
0 255 510 Feet
1 inch = 500 feet
CLUB CENTE

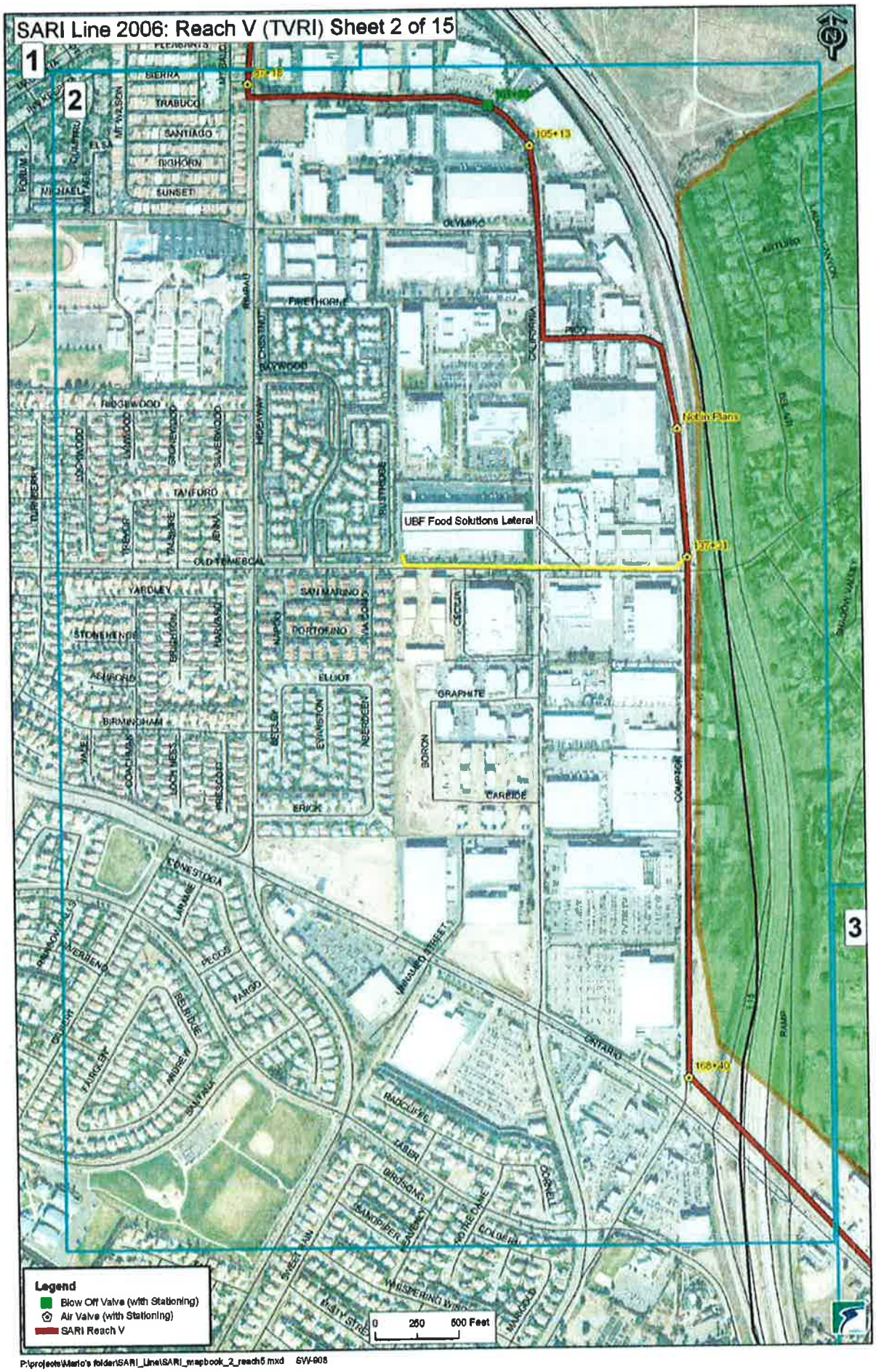
REACH

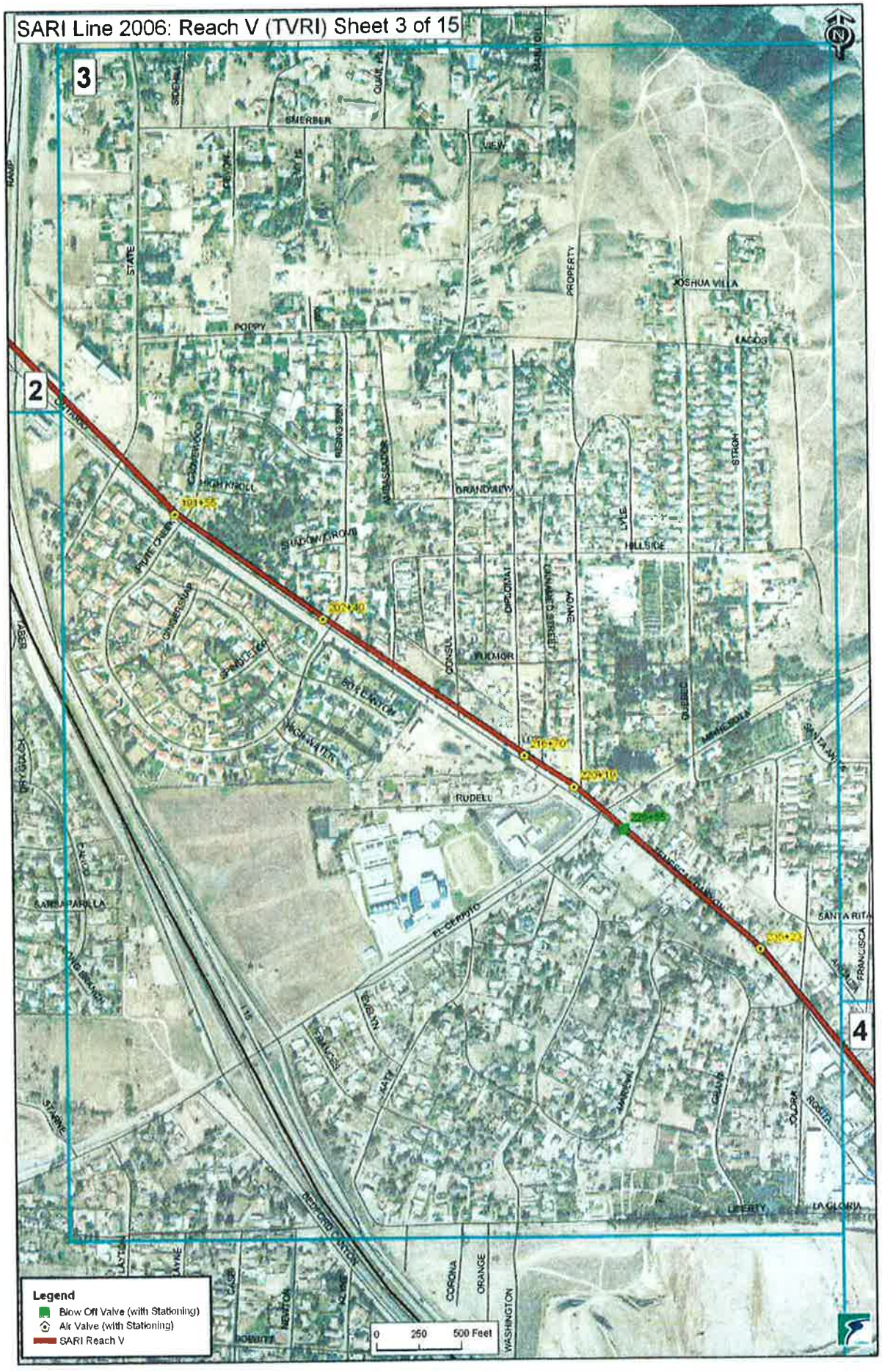
V

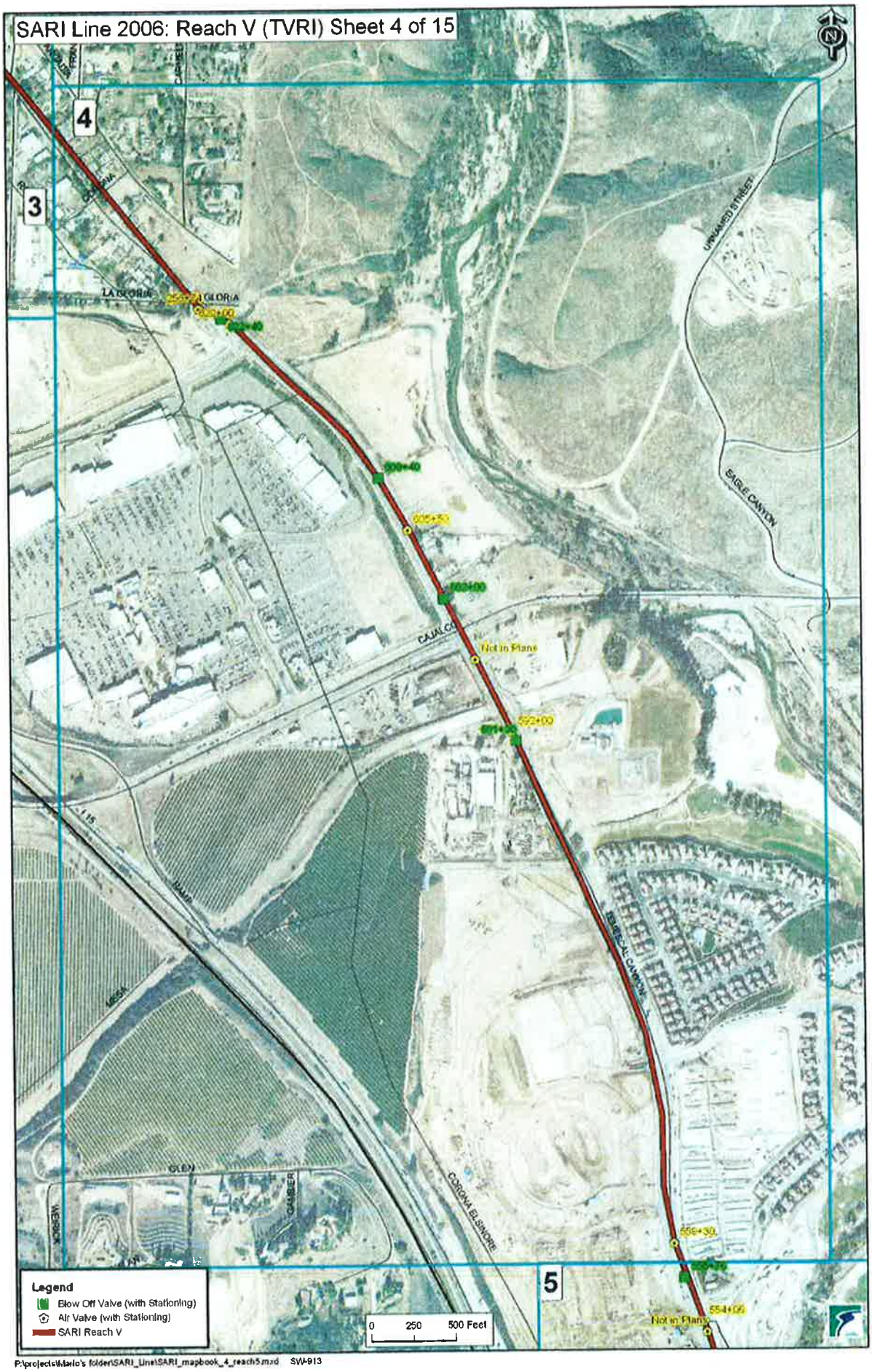
SARI Line 2006: Reach V (TVRI) Sheet 1 of 15

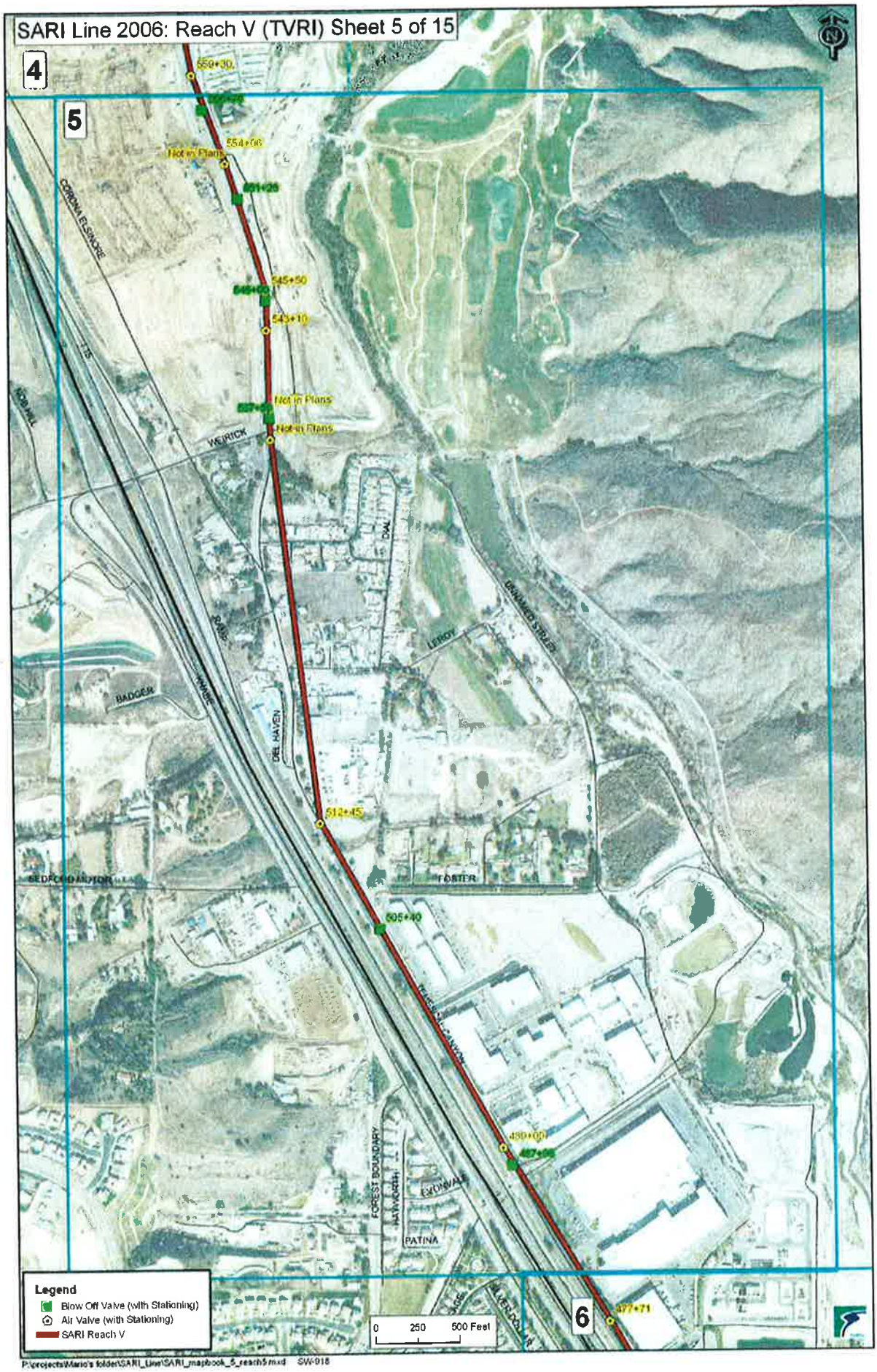


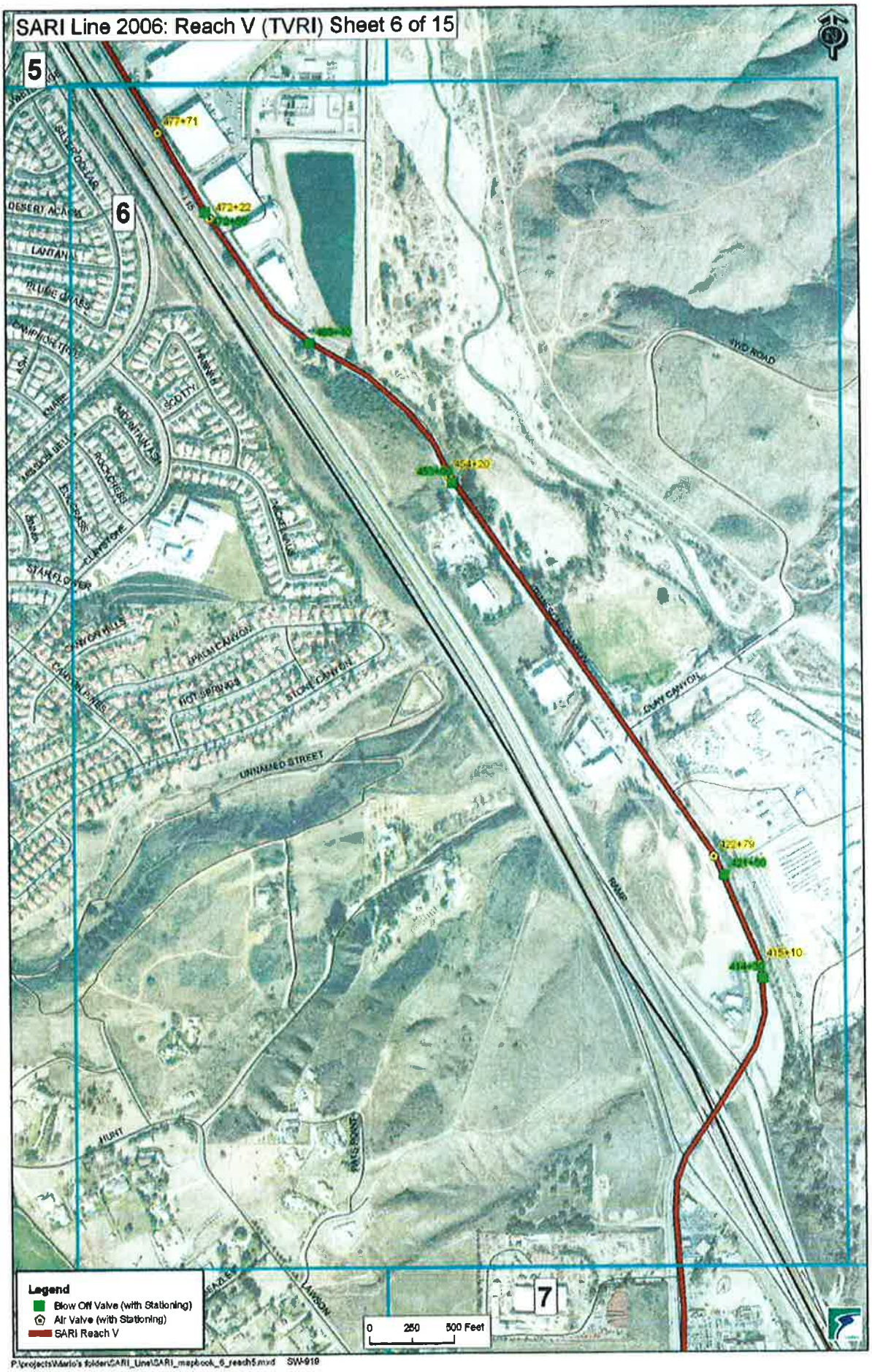
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_1_reach5.mxd SW-896

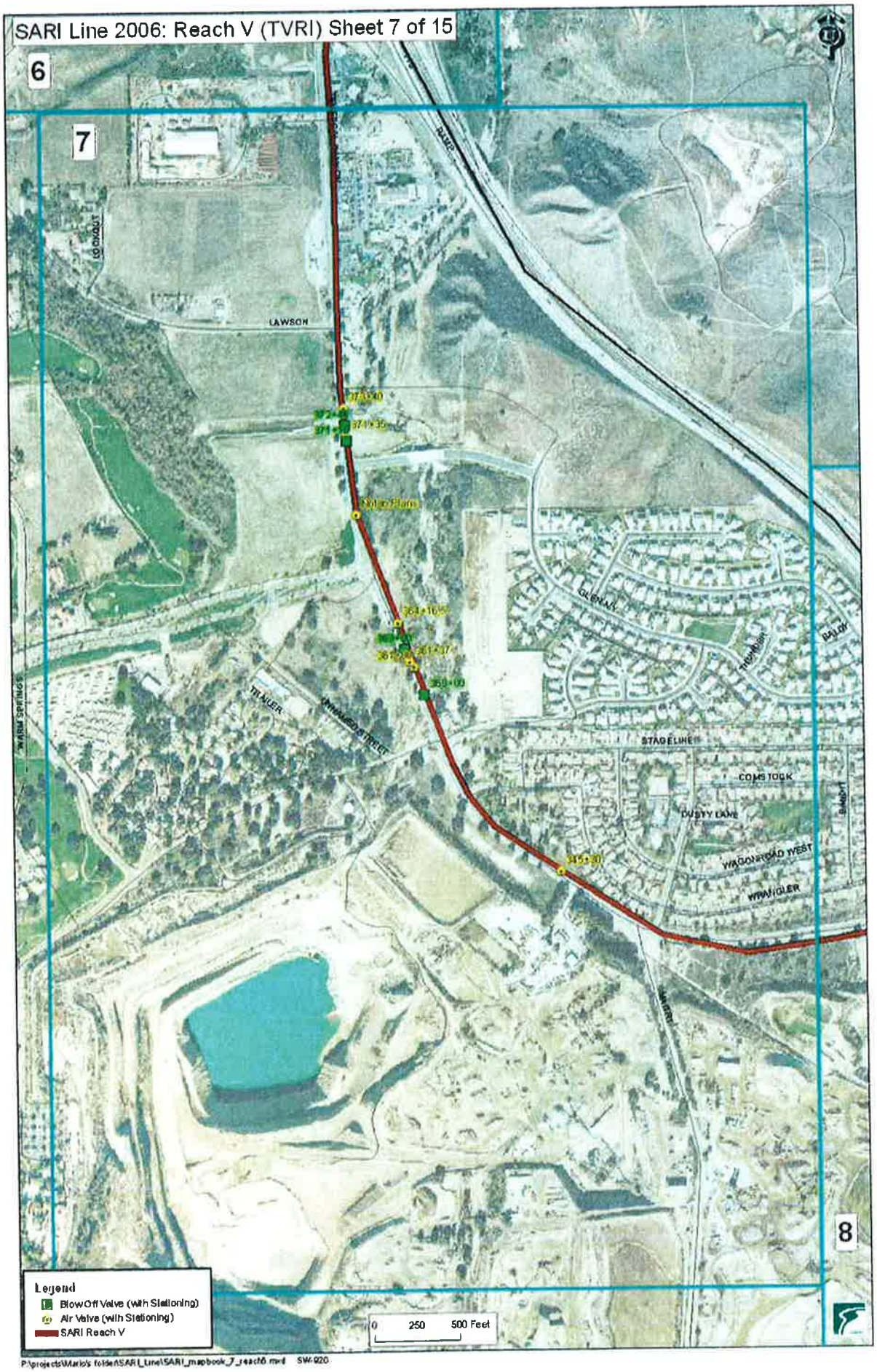

SARI Line 2006: Reach V (TVRI) Sheet 2 of 15
1
2
3
SIERRA
TRABUCO
SANTIAGO
BIGHORN
SUNSET
MICHAEL
ELSA
MT WASHBURN
FOREST
PIEDMONT
OLIVE
FAIRTHORNE
RIDGEWOOD
TAFFORD
OLD TOMEBOAL
YARDLEY
STONEHENGE
ASHFORD
BIRMINGHAM
SAN MARINO
PORTOFINO
ELLIOT
GRAPHITE
BORON
CARBIDE
ERICK
EVANSTON
ABERDEEN
BERGEN
LOCH WEST
YALE
GOANCHAM
CONESTOGA
LARAMIE
PECOS
PARROD
BELRIDGE
MISHEEN
SAN PAULA
FAIRCREST
RADCLIFFE
BIRDSONG
SWEETBRIAR
WHISPERING WIND
MARIGOLD
ONTARIO
MAGNOLIA STREET
CAMPUS
CITRUS
ARTURO
LEDGE CANYON
BELAIR
SHADOW VALLEY
RAMP
105+13
Notch Plans
UBF Food Solutions Lateral
168+40
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_2_reach5.mxd SW-905

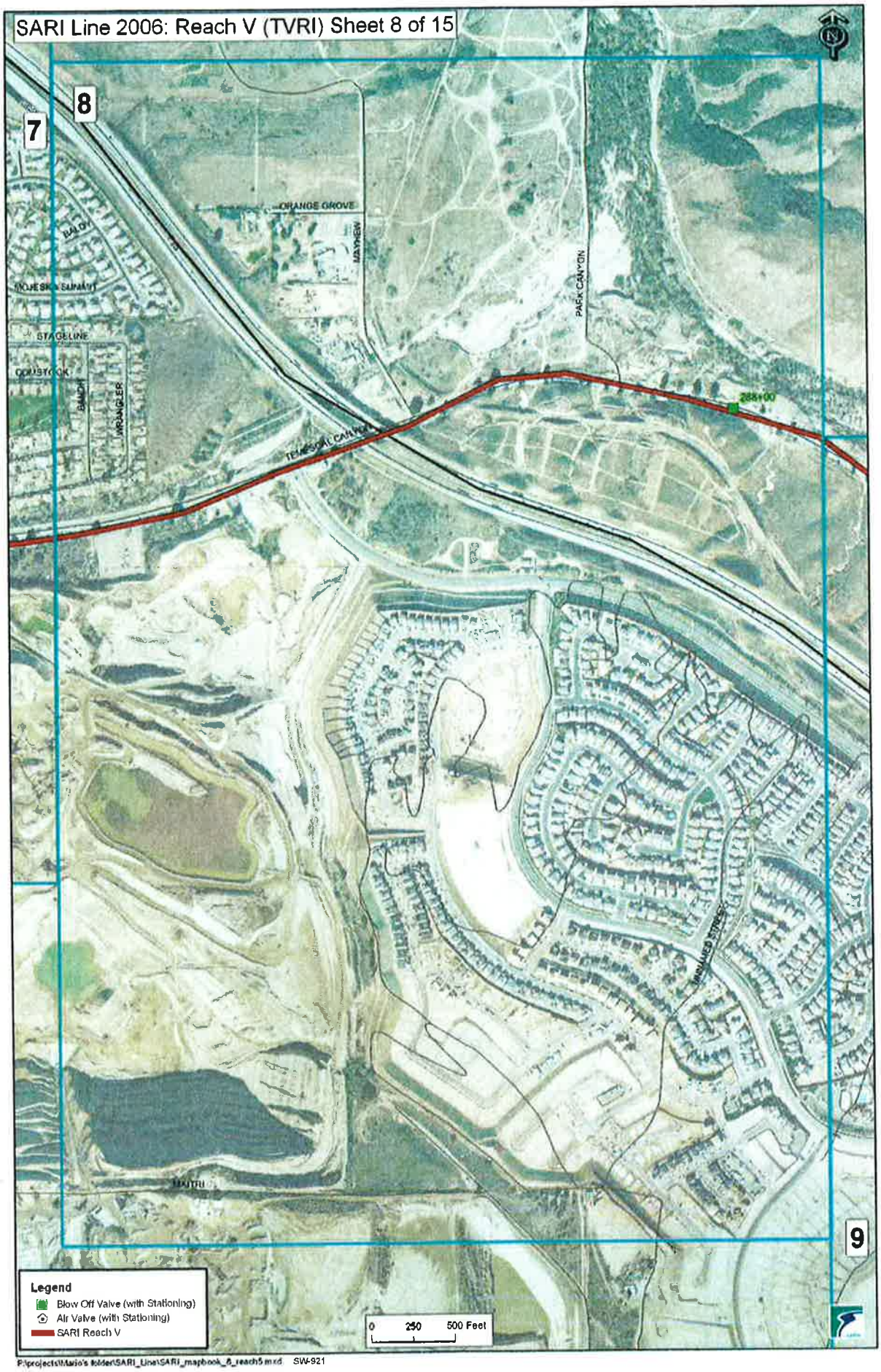

SARI Line 2006: Reach V (TVRI) Sheet 3 of 15
3
2
4
SMERBER
POPPY
JOSHUA VILLA
LACOS
HIGH KNOLL
GRANDVIEW
RUDELL
SANTA RITA
LIBERTY
LA GLORIA
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0 250 500 Feet


SARI Line 2006: Reach V (TVRI) Sheet 4 of 15
4
3
5
LA GLORIA
UNNAMED STREET
EAGLE CANYON
Not in Plans
TEMESCAL CANYON
CORONA ELSINORE
GLEN
WERNER
GARNER
MESA
I 15
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet
P:\projects\Marlo's folder\SARI_Line\SARI_mapbook_4_reach5.mxd SVA-913

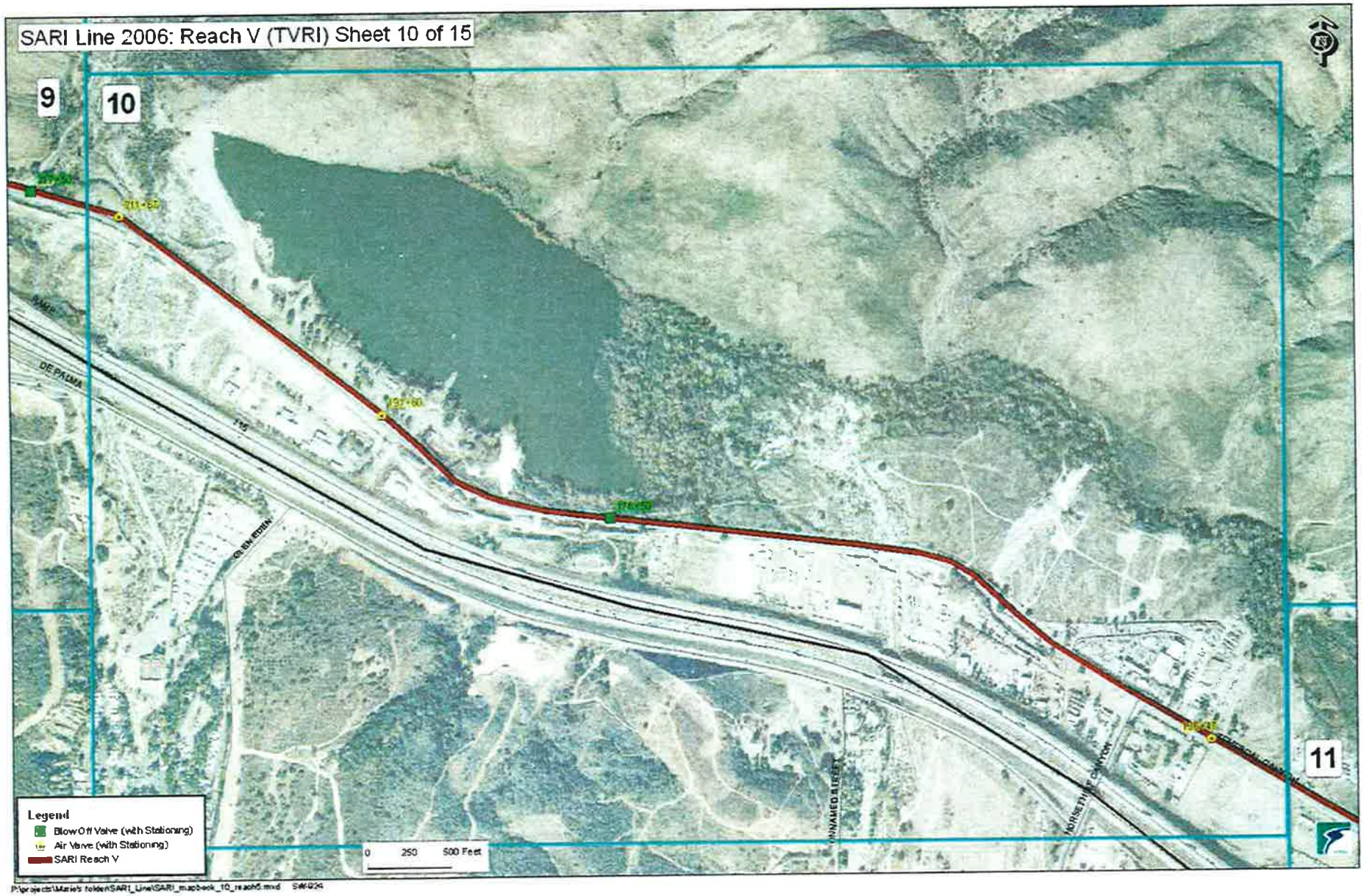

SARI Line 2006: Reach V (TVRI) Sheet 5 of 15
4
5
6
550+30
554+06
Not in Plans
551+25
545+50
545+00
543+10
537+00
Not in Plans
Not in Plans
512+45
505+40
480+00
467+06
477+71
CORONA EL SHORE
T15
WEIRICK
DWL
BENNETT STREET
LEROY
BADGER
DEL HAVEN
FOSTER
FOREST BOUNDARY
HAYWORTH
PATINA
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_5_reach5.mxd SW-918

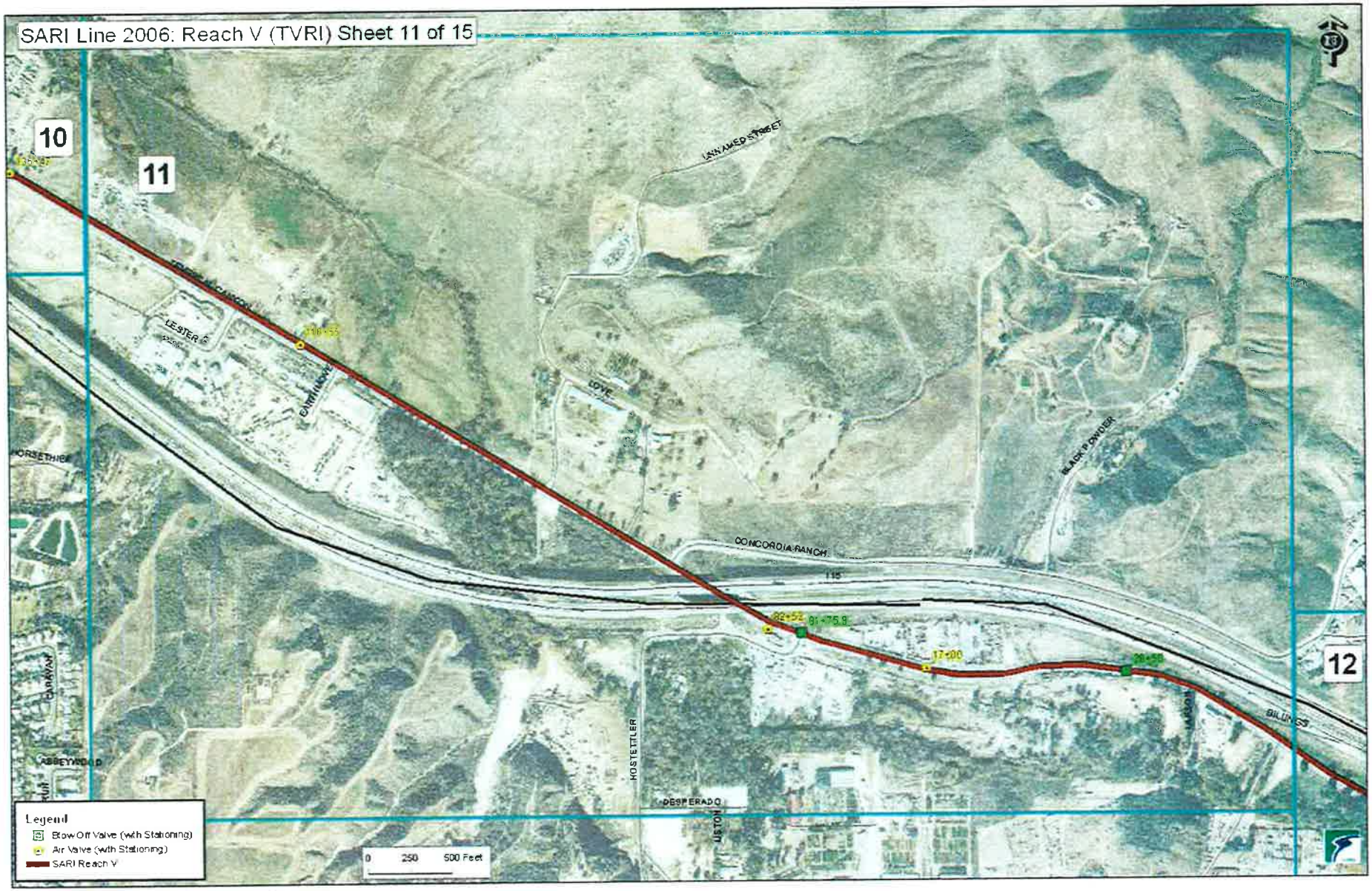

SARI Line 2006: Reach V (TVRI) Sheet 6 of 15
5
6
7
477+71
472+22
454+20
422+79
415+10
DESERT ACADEMY
LANTANA
BLUE GRASS
SCOTTY
ROCKPOINT
EVERGREEN
CLIFFSIDE
STARFLOWER
CANYON HILLS
PALM CANYON
HOT SPRINGS
STONE CANYON
UNNAMED STREET
4WD ROAD
GRAY CANYON
RAMP
HUNT
PAGE RANCH
LAWSON
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_6_reach5.mxd SW-010


SARI Line 2006: Reach V (TVRI) Sheet 7 of 15
6
7
8
LAWSON
TRAILER
STAGELINE
COMSTOCK
DUSTY LANE
WAGONROAD WEST
WRANGLER
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_7_reach5.mxd SW:920

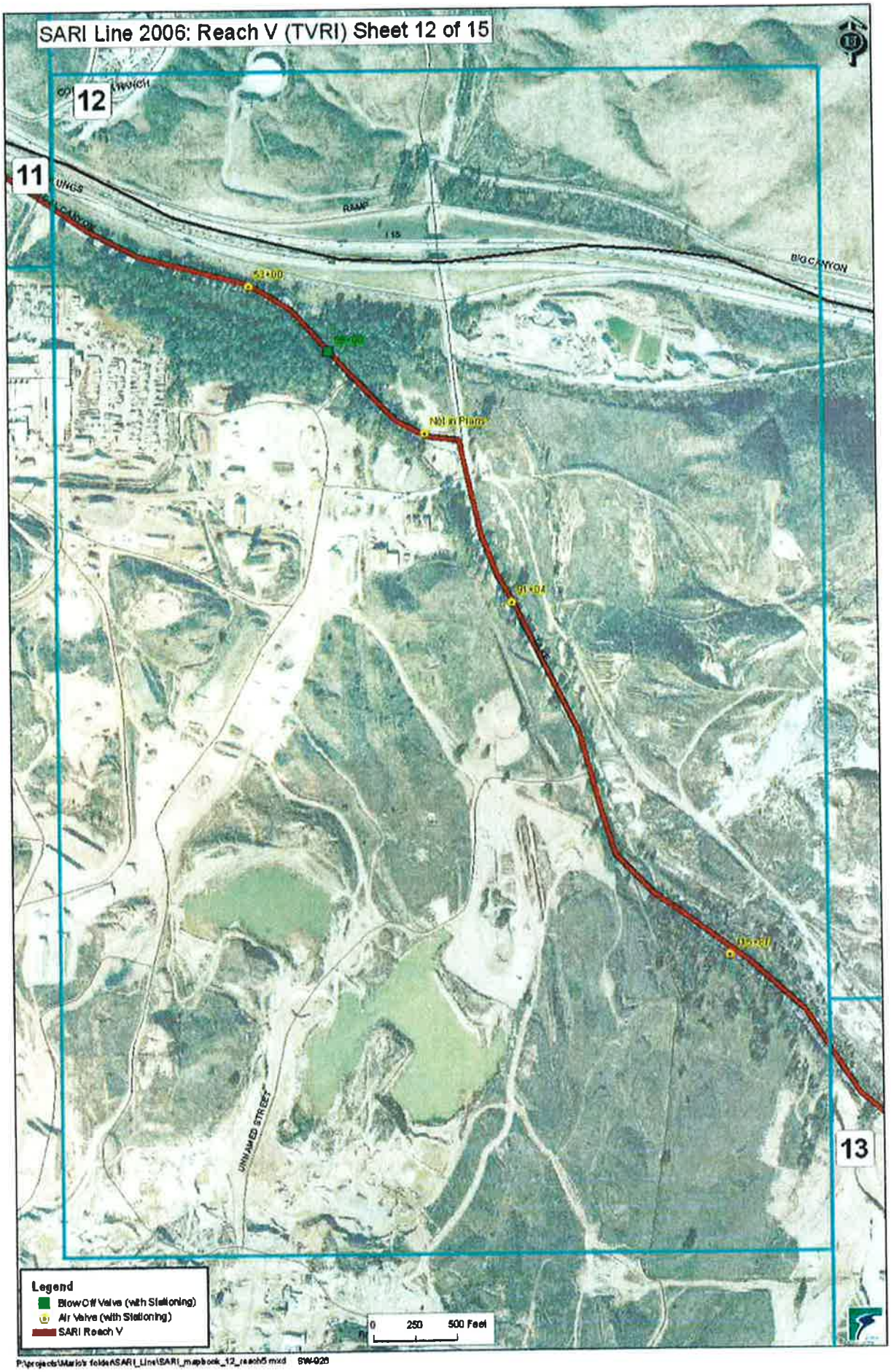

SARI Line 2006: Reach V (TVRI) Sheet 8 of 15
8
7
9
ORANGE GROVE
MAYHEW
PARK CANYON
STAGELINE
BALDY
BRANCH
WRANGLER
288+00
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_6_reach5.mxd SW-921

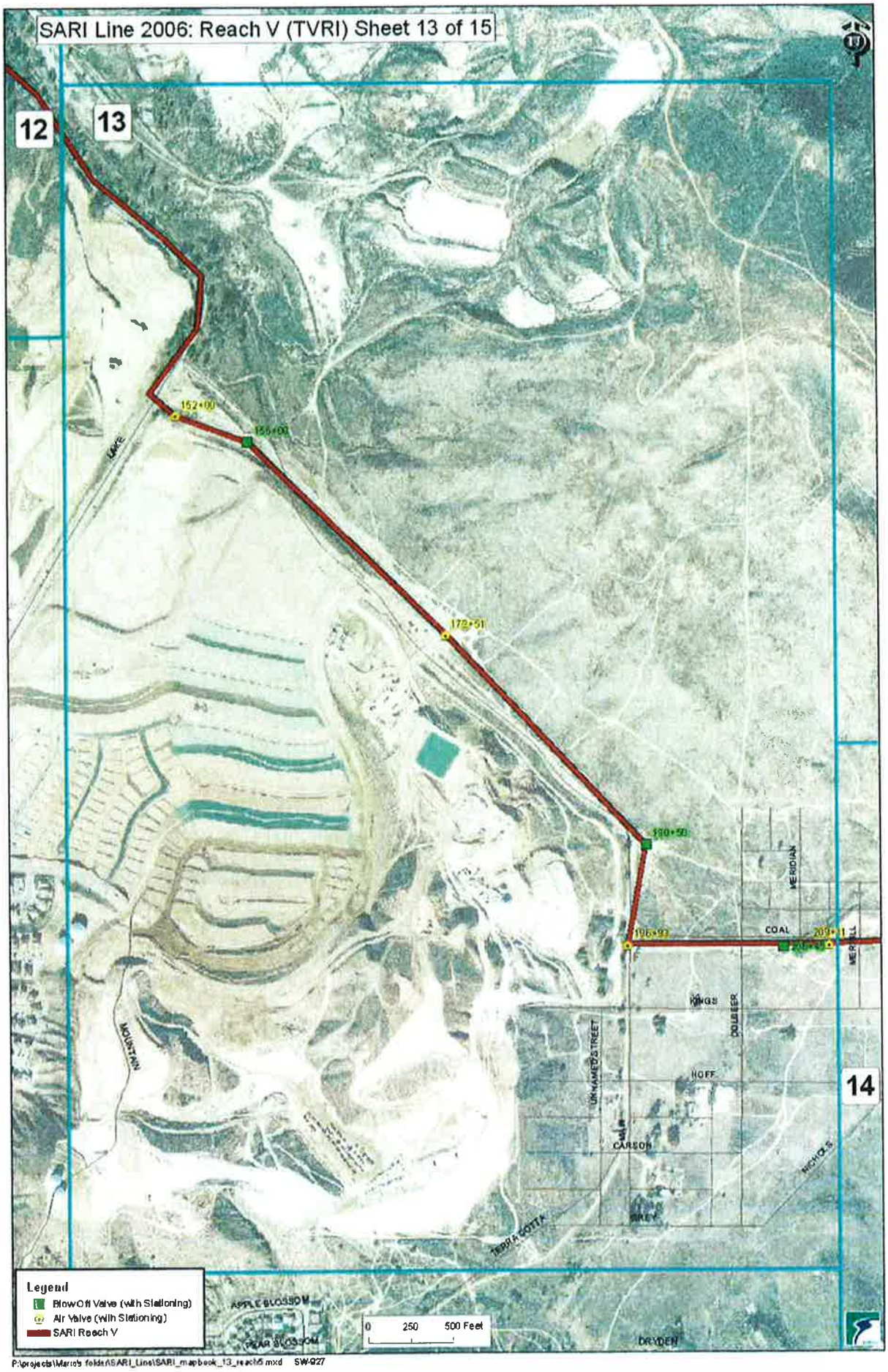

SARI Line 2006: Reach V (TVRI) Sheet 9 of 15
9
8
10
EL HERMANO
CANYON CREEK
Pump Plant
226+94
UNNAMED STREET
CAMPBELL RANCH
INDIAN TRUCK
RAMP
DE PALM
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet
P:\projects\Maria's folder\SARI_Line\SARI_mapbook_9_reach5.mxd SW 922


SARI Line 2006: Reach V (TVRI) Sheet 10 of 15
9
10
11
211+62
232+60
DE PALMA
UNNAMED STREET
HORSETHIEF CANYON
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet

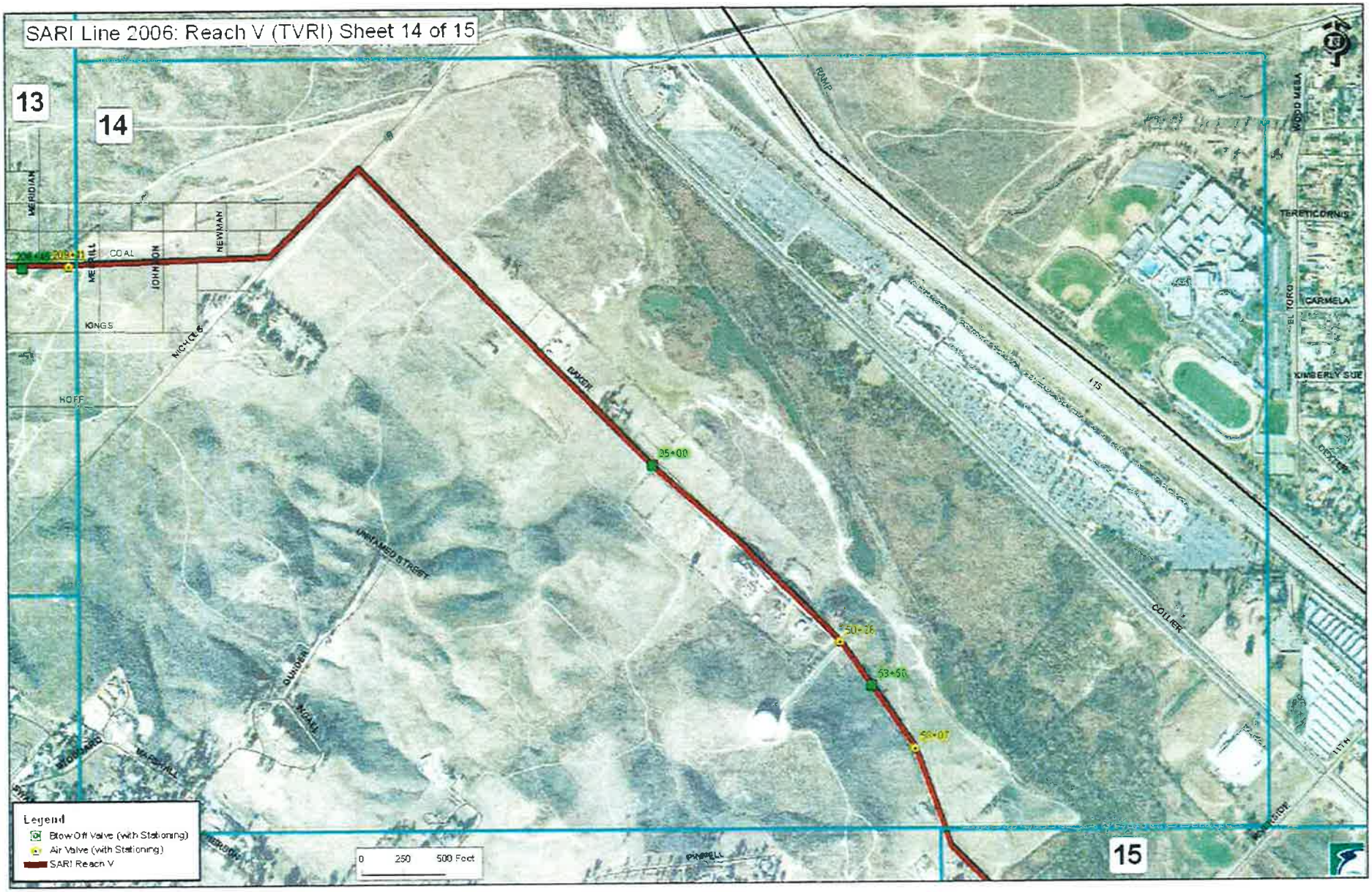


P:\projects\Mario's folder\SARI_Line\SARI_mapbook_11_reach5.mxd SW-GIS

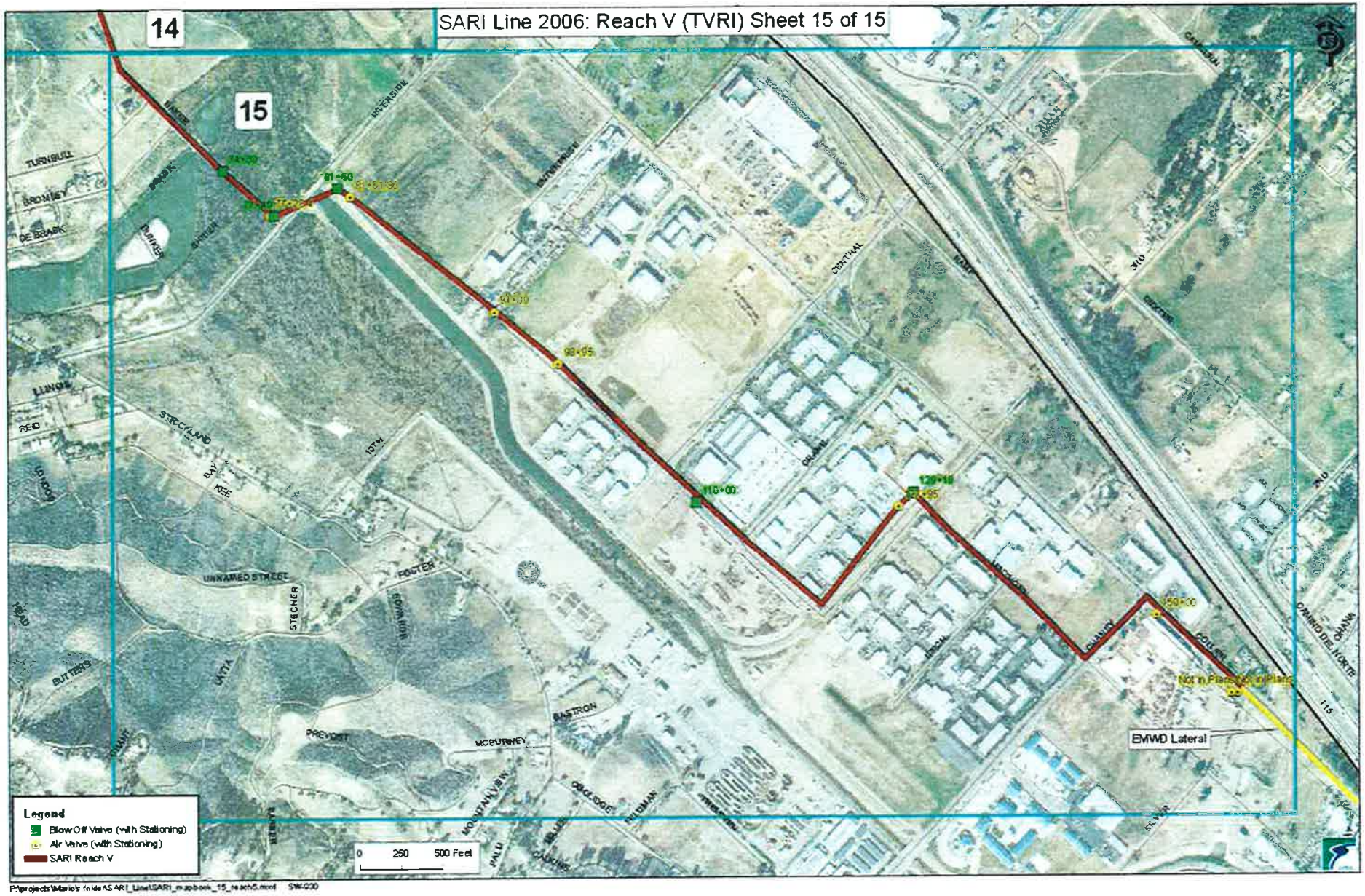

SARI Line 2006: Reach V (TVRI) Sheet 12 of 15
12
11
13
BIG CANYON
52+00
Not in Plans
91+04
UNNAMED STREET
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0
250
500 Feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_12_reach5.mxd SW-026



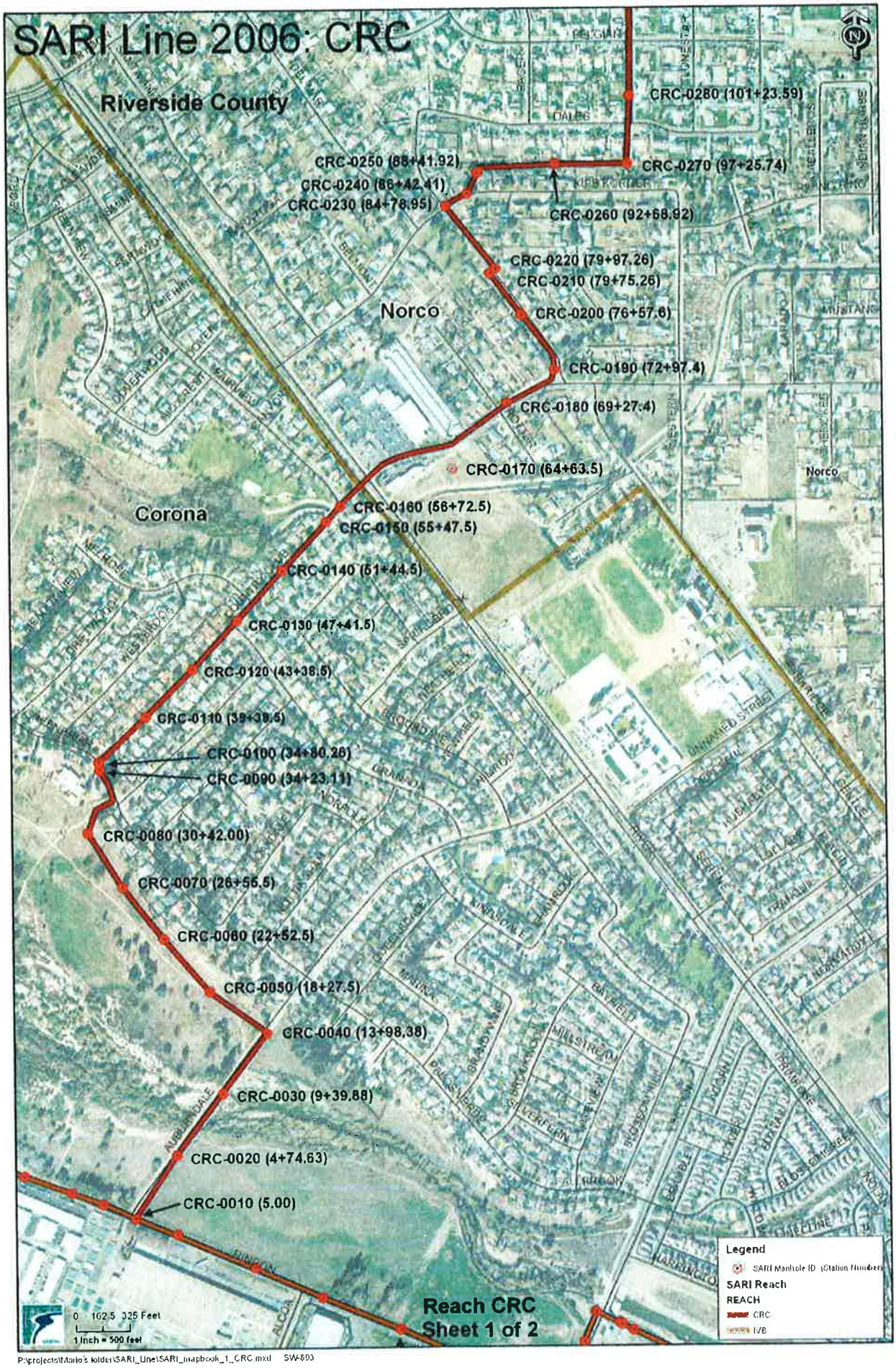
P:\projects\Marrio's folder\SARI_Lines\SARI_mapbook_13_reach5.mxd SW-927



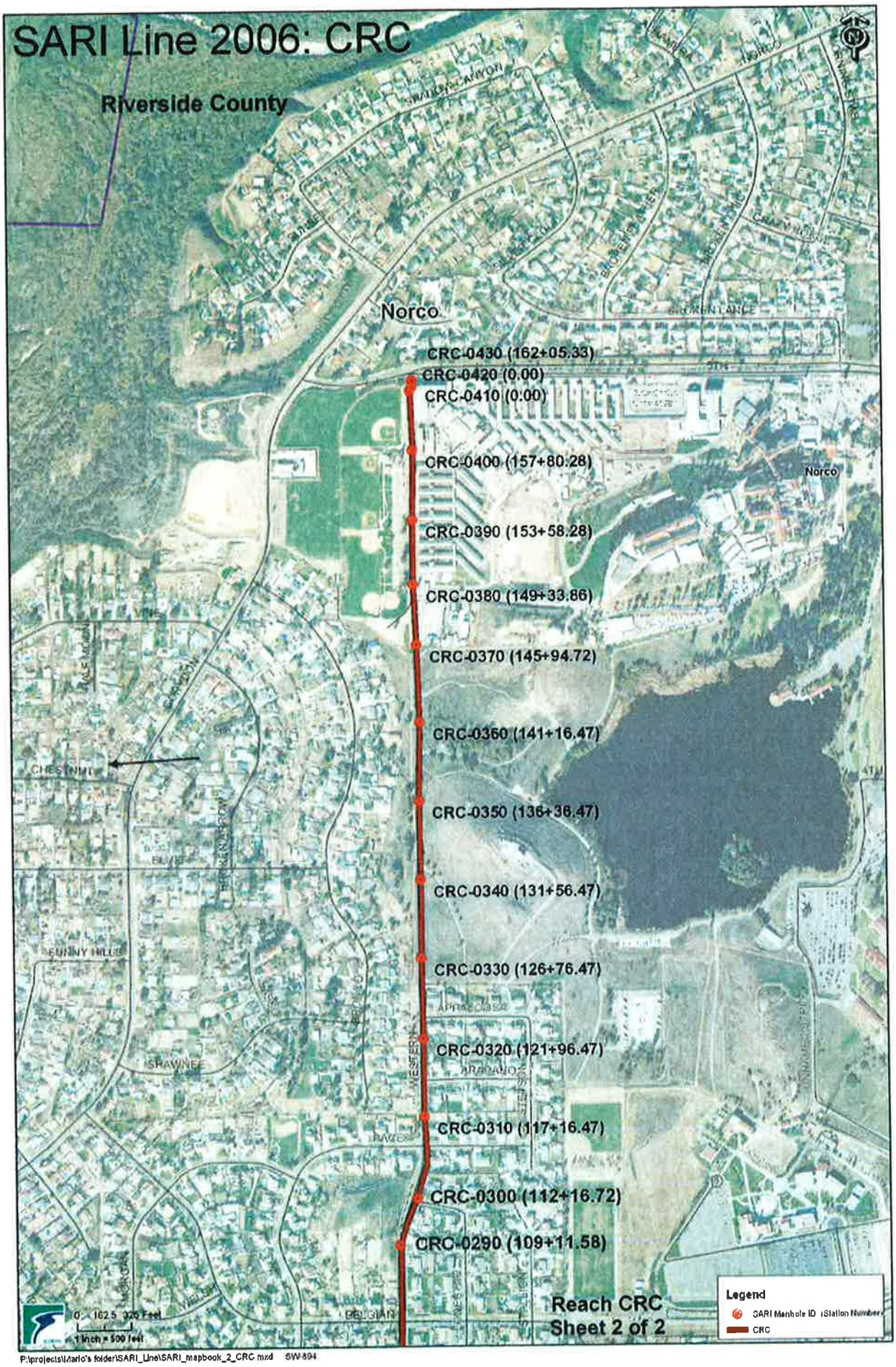
P:\projects\Maria's folder\SARI_Line\SARI_mxdbook_14_reach5.mxd SW-029


SARI Line 2006: Reach V (TVRI) Sheet 15 of 15
14
15
Legend
Blow Off Valve (with Stationing)
Air Valve (with Stationing)
SARI Reach V
0 250 500 Feet
EMWD Lateral

CRC

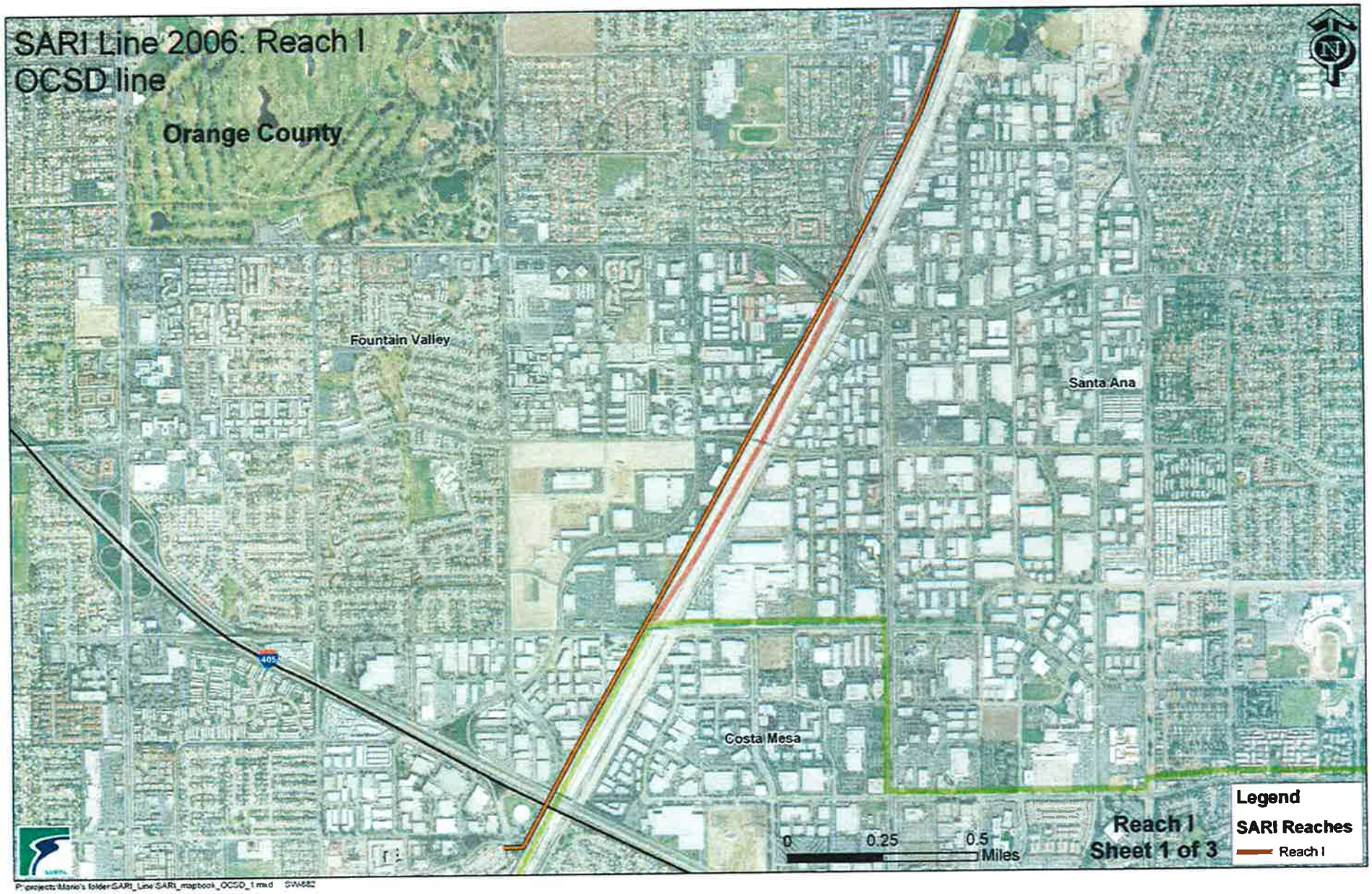


P:\projects\Mario's folder\SARI_Line\SARI_mapbook_1_CRC.mxd SW-603

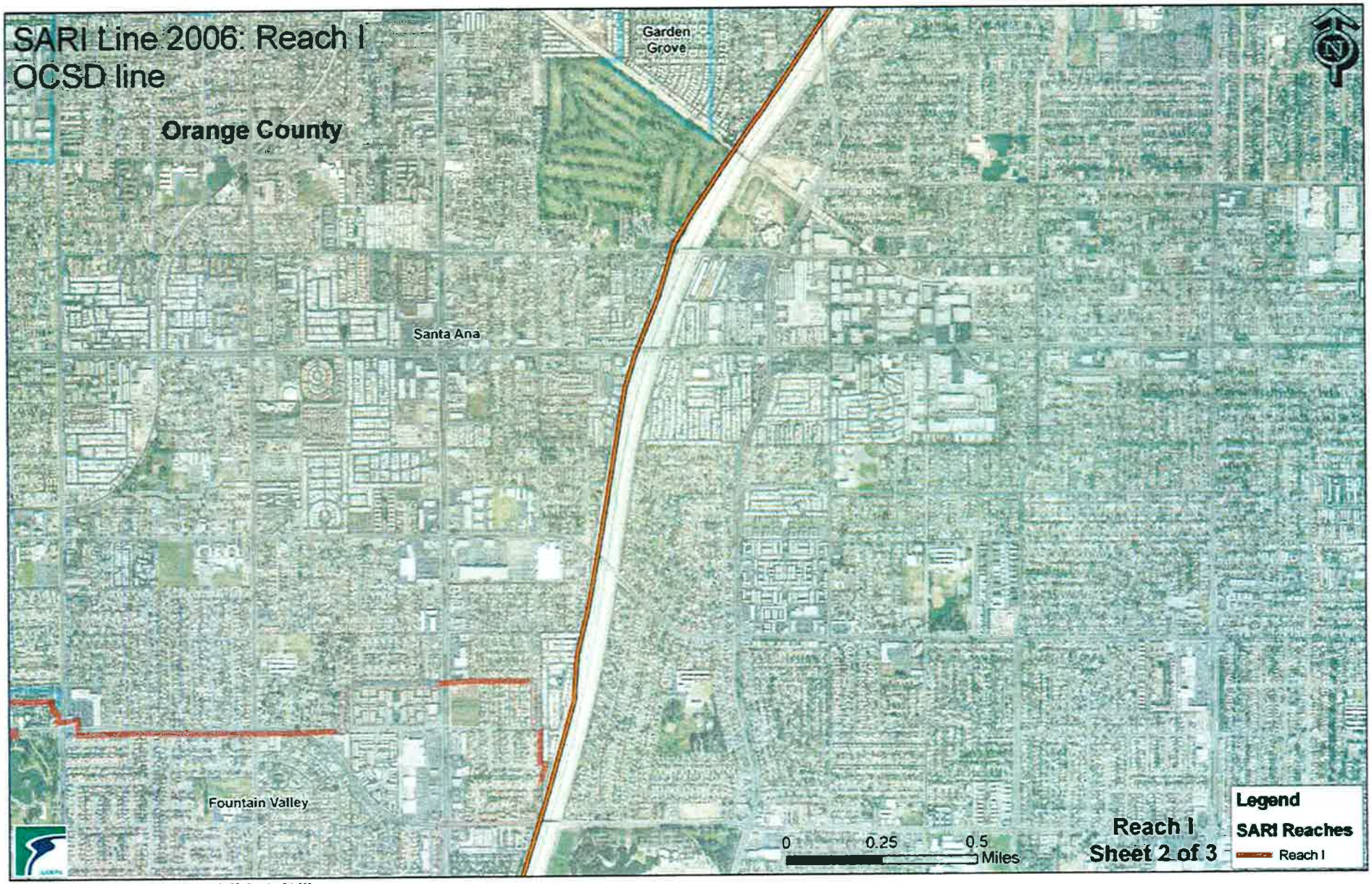

SARI Line 2006: CRC
Riverside County
Norco
CRC-0430 (162+05.33)
CRC-0420 (0.00)
CRC-0410 (0.00)
CRC-0400 (157+80.28)
CRC-0390 (153+58.28)
CRC-0380 (149+33.86)
CRC-0370 (145+94.72)
CRC-0360 (141+16.47)
CRC-0350 (136+36.47)
CRC-0340 (131+56.47)
CRC-0330 (126+76.47)
CRC-0320 (121+96.47)
CRC-0310 (117+16.47)
CRC-0300 (112+16.72)
CRC-0290 (109+11.58)
Reach CRC
Sheet 2 of 2
Legend
SARI Manhole ID (Station Number)
CRC
0 162.5 325 Feet
1 Inch = 500 feet
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_2_CRC.mxd SW-604

REACH

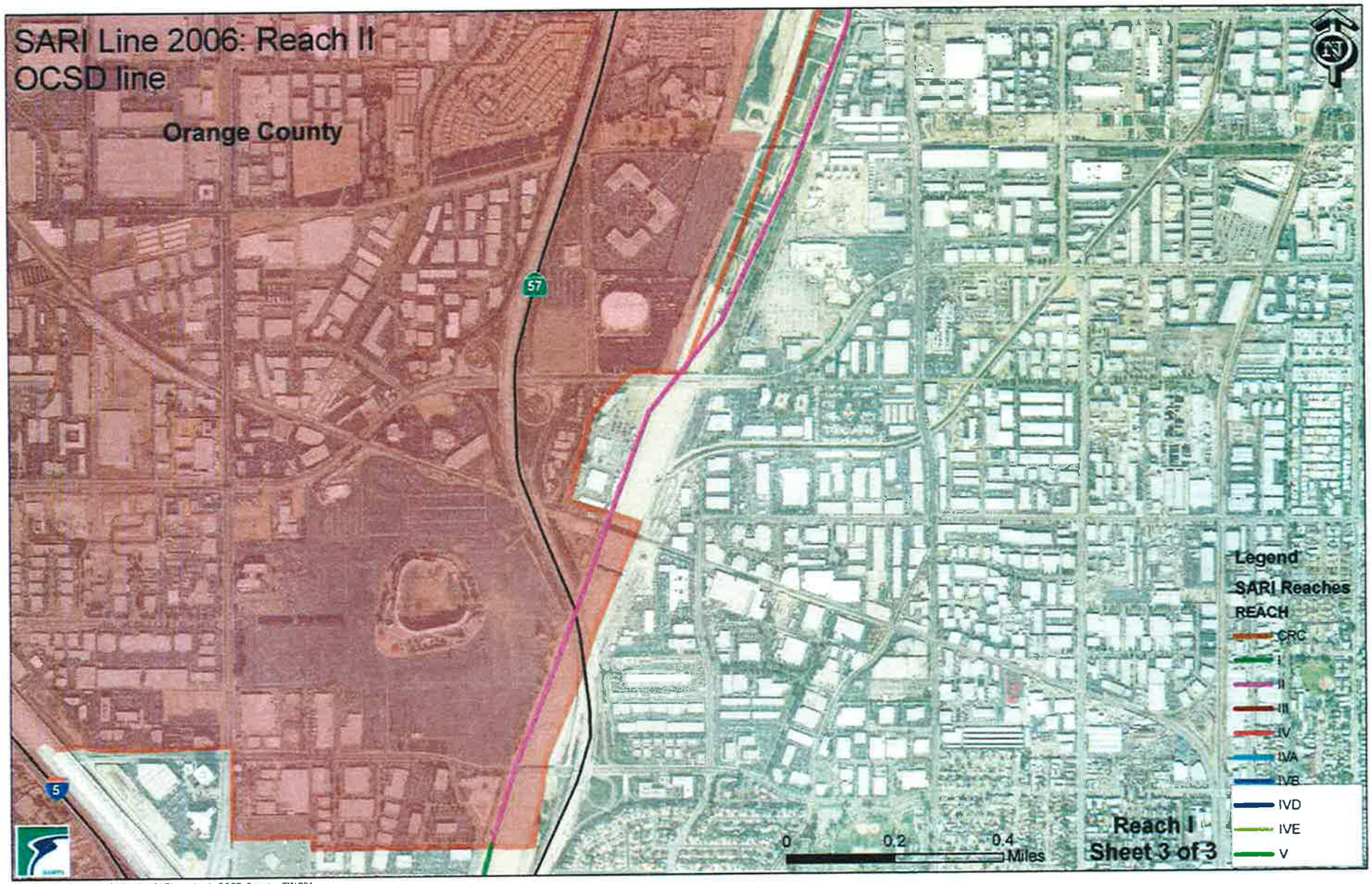
I



P:\projects\Marie's folder\SARI_Line\SARI_mapbook_OCSD_1.mxd SWM682



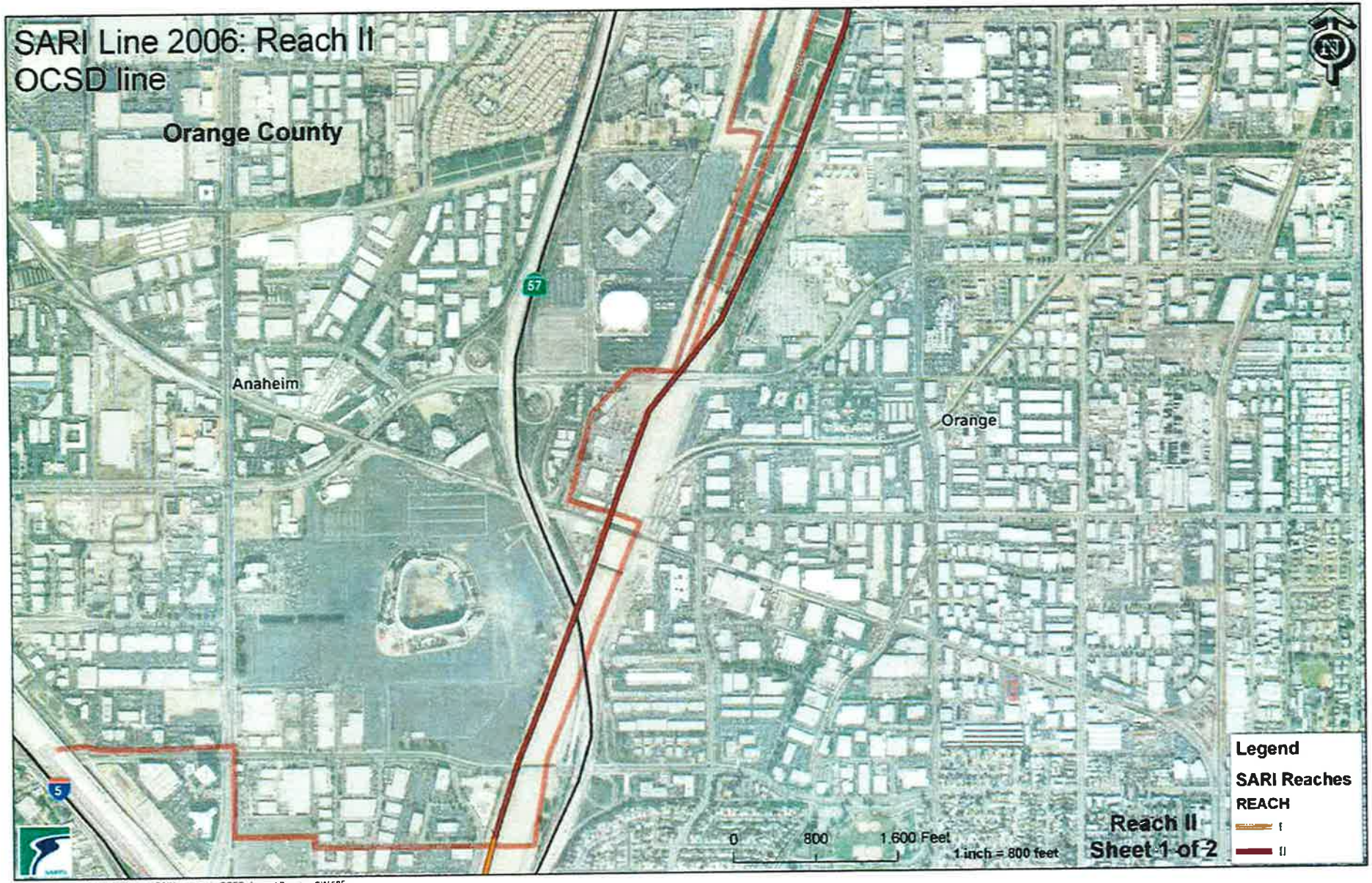
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_OCSD_2.mxd SVN-850



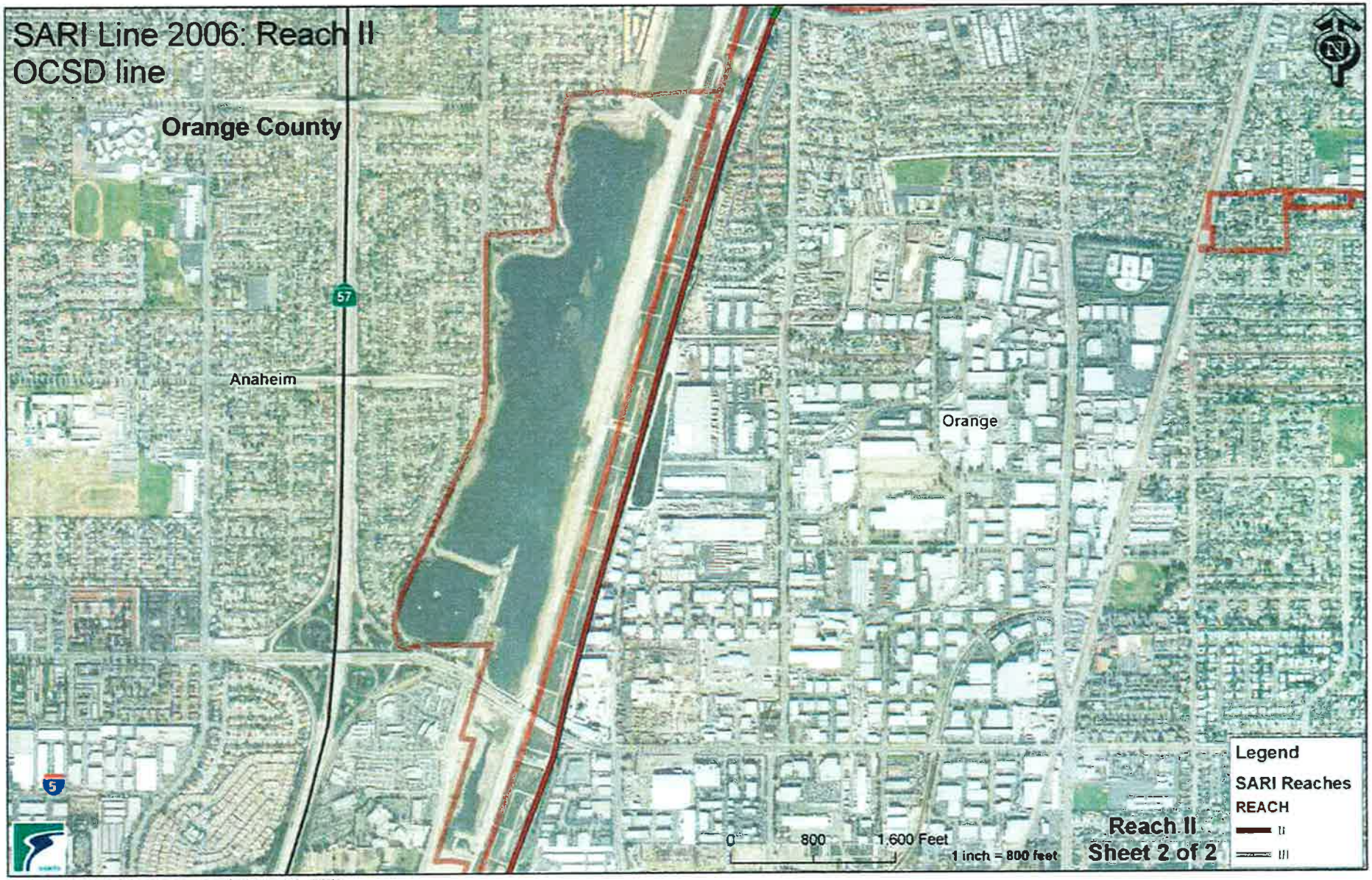
P:\projects\Mario's folder\SARI_Line\SARI_mapbook_OCSD_3.mxd SW-884

REACH

II

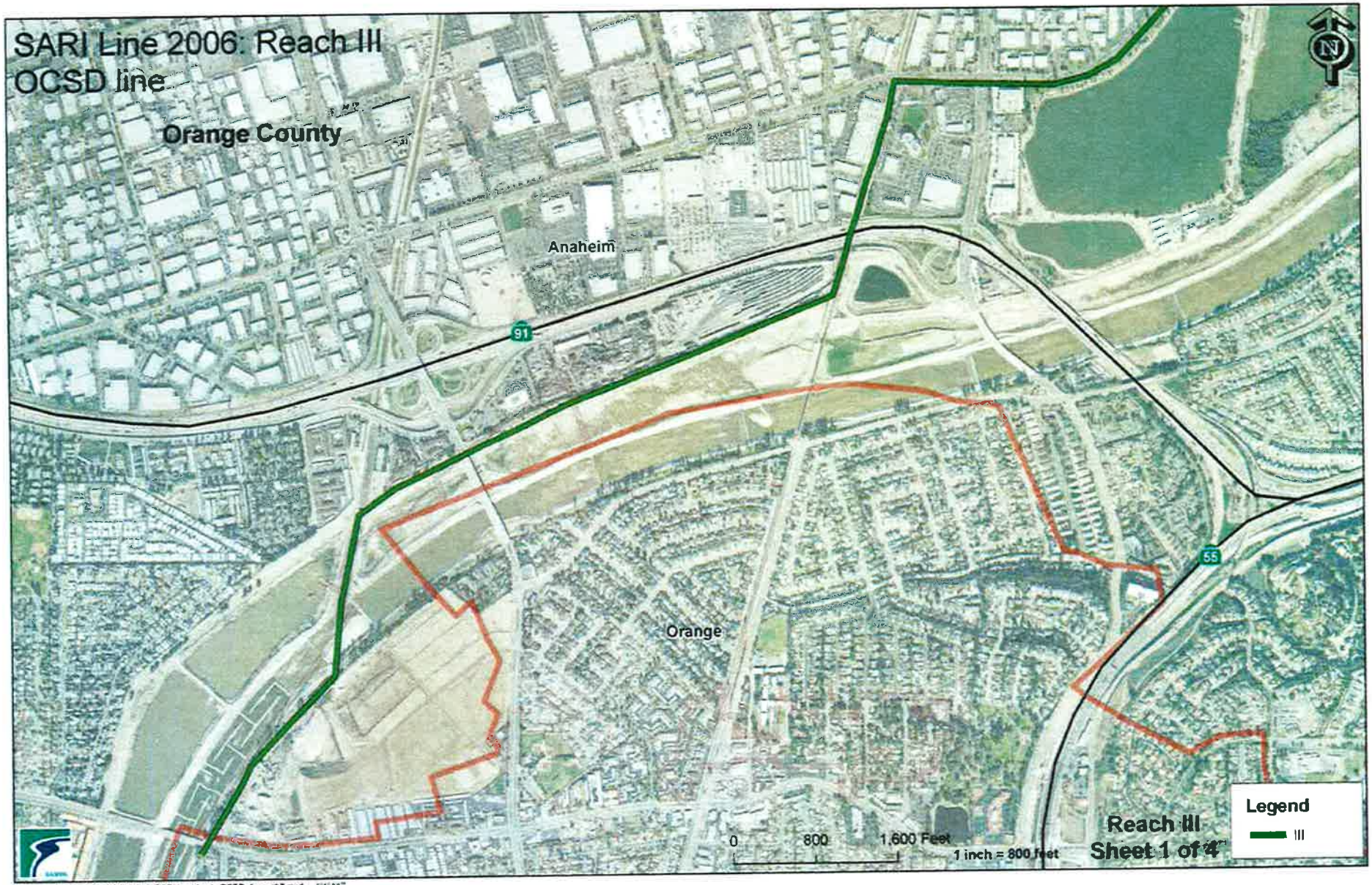


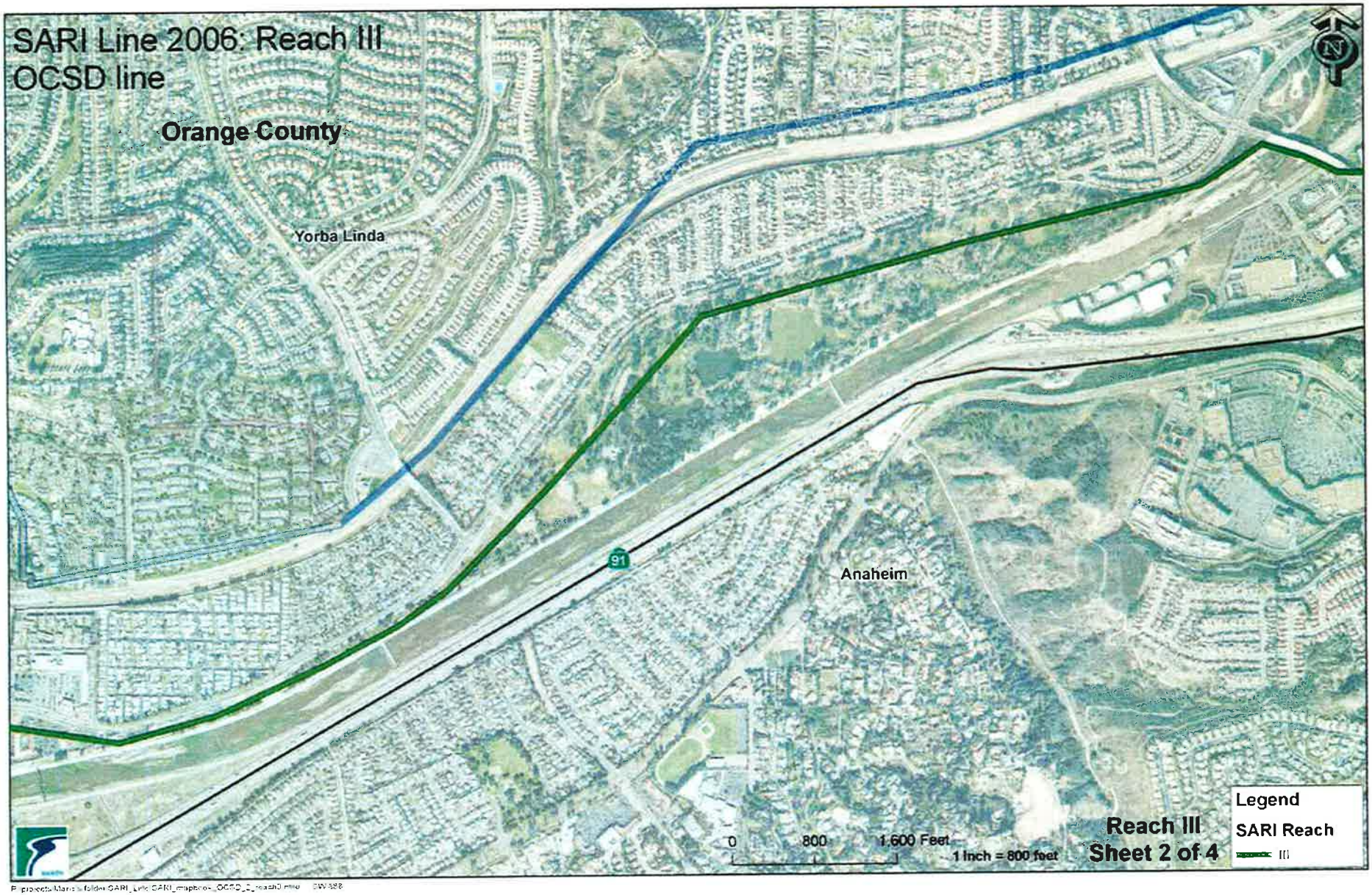
P:\projects\Maps\...\SARI_Line\SARI_mupdate\...OCSD_1_reach2.mxd 04/06/05


SARI Line 2006: Reach II
OCSD line
Orange County
57
Anaheim
Orange
5
0
800
1,600 Feet
1 inch = 800 feet
Reach II
Sheet 2 of 2
Legend
SARI Reaches
REACH
II
III

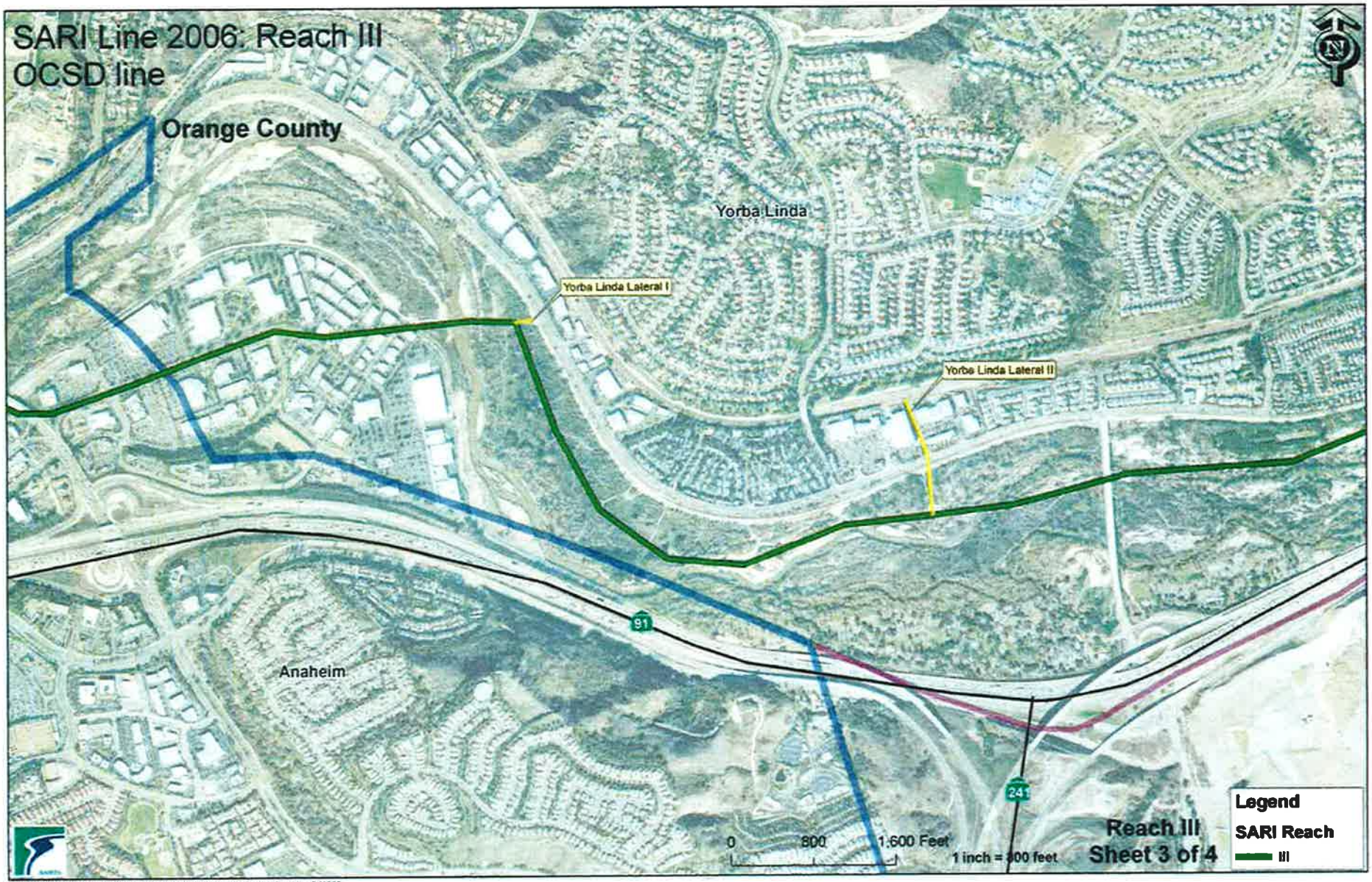
REACH

III

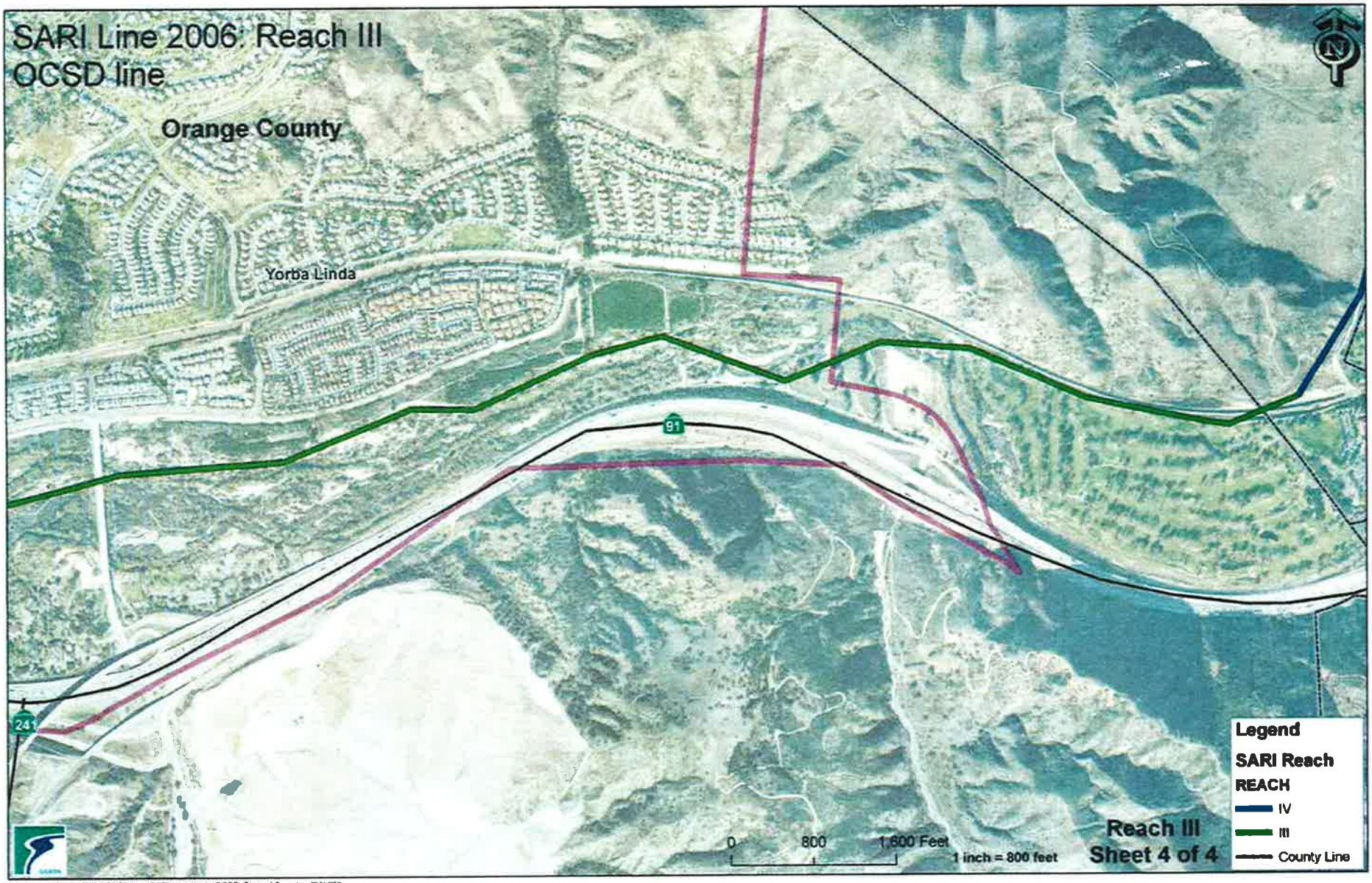

SARI Line 2006: Reach III
OCSD line
Orange County
Anaheim
91
55
Orange
0
800
1,600 Feet
1 inch = 800 feet
Reach III
Sheet 1 of 4
Legend
III



P:\projects\Maps\folder\SARI_Line\SARI_map\sari_OCSD_3_reach3.mxd DW 8/8



P:\projects\Mario's folder\SARI_Line\SARI_mapbook_OCSD_2_reach3.mxd SW-888



P:\projects\Mario's folder\SARI_Line\SARI_mapbook_OCSD_2_reach3.mxd SAI-859

Appendix B

WMWD Wastewater Operations Enterprise
Collections Division Maintenance Access Structure Inspection Form

Date: _____ Inspector: _____

MAS ID: _____ WMWD MAS ☐ SAWPA MAS ☐

Photo Documentation: Y / N
Traffic Control Required Y / N
Traffic Permit Required Y / N

I. General Inspection

A. Location:
- 1 Roadway ☐
- 2 Gutter ☐
- 3 Paved Alley ☐
- 4 Unpaved Alley ☐
- 5 Easement ☐
- 6 Other ☐

B. Cover, Ring and Frame:
- 1 Serviceable ☐
- 2 Damaged ☐
- 3 Displaced ☐
- 4 Missing Grout ☐
- 5 Needs Raising ☐
- 6 Needs Lowering ☐

C. MAS Lid Cover Size:
- 1 24 Inch ☐
- 2 30 inch ☐
- 3 36-inch ☐
- 4 Bolted Cover ☐
- 5 Locking ☐

D. MAS Surface Area Observations
- 1 Clear ☐
- 2 Over Grown ☐
- 3 Inaccessible ☐

E. Assessment for Odors
- 1 None Noted ☐
- 2 Noticeable ☐
- 3 Sever ☐

F. Structure Type
- 1 Concrete ☐
- 2 Brick ☐
- 3 Other ☐

II. Structural Inspection

A. Corrosion Protection:
- 1 Normal ☐
- 2 Liner Failure ☐

B. Cone:
- 1 Serviceable ☐
- 2 Broken ☐
- 3 Corroded ☐
- 4 Misaligned ☐
- 5 Leaking/Bad Joint ☐

C. Riser:
- 1 Serviceable ☐
- 2 Broken ☐
- 3 Corroded ☐
- 4 Misaligned ☐
- 5 Leaking/Bad Joint ☐

D. Shelf:
- 1 Serviceable ☐
- 2 Broken ☐
- 3 Dirty ☐
- 4 Corroded ☐
- 5 Bad Base Joint ☐

E. Channel:
- 1 Serviceable ☐
- 2 Obstructed ☐
- 3 Corroded ☐
- 4 Bad Pipe Joint ☐
- 5 Silt ☐
- 6 Poor Struck. Cond. ☐

F. Identification Stake Y / N

III. Hydraulic Inspection

A. Inflow Indications:

Debris on Sides/Shelf ☐

B. Surcharge Indication:

Grease and Debris on Sides and Shelf ☐

C. Clarity of Flow:
- 1 Turbid Appearance ☐
- 2 Clear Appearance ☐

D. Flow:
- 1 Steady ☐
- 2 Pulsing ☐
- 3 Turbulent ☐
- 4 Surcharging ☐
- 5 Sluggish ☐

E. Flow Depth Compared to Adjacent Manhole Structures
- 1 Same ☐
- 2 Lower ☐
- 3 Higher ☐
- 4 None Taken ☐

F. Flow Depth
Measurement _____ Inches
Time _____ am/pm

IV. SARI System Information

A. MAS Diameter (inch) ____

B. MAS Lid Diameter (Inch) ____

C. MAS Lid Bolted Y / N

D. Sealed Watertight Y / N

E. Location of Seal
- 1. At-Grade ☐
- 2. Below Grade ☐

F. Inlet Pipe Diameter (inch) ____

G. Outlet Pipe Diameter (inch) ____

H. Connection Y / N

I. Connection Size (inch) ____

J. Corrosion Protection Y / N

K. Corrosion Protection Type
- 1. T-Lock ☐
- 2. Other ☐

L. Identification Stake/ # Y / N

V. Work Order Request Informat

Work Order Written Y / N
Priority: 1. Urgent ☐
2. Routine ☐

General Comments: _____

Maintenance Work Order Comments: _____

Supervisor Comments: _____