APPENDIX 2.4 – Sub-catchment Imperviousness

Table IMP – Sub-catchment (Basin) Imperviousness

Table I1 – Summary of 15 Sub-catchments - Imperviousness Measurements (Actual) vs. Satellite Imagery

Graph 1 – Linear Equation to Compute Imperviousness as a Function of Satellite Imagery (Based on 15 Sub-catchments - Imperviousness Measurements (Actual) vs. Satellite Imagery)

Graph 2 – Polynomial Equation to Compute Imperviousness as a Function of Satellite Imagery (Based on 15 Sub-catchments - Imperviousness Measurements (Actual) vs. Satellite Imagery)

Table I2 – 15 Sub-catchments - Imperviousness Measurements (Actual) vs. Satellite Imagery

Fifteen Figures (orthophotographs) that document
the 15 Sub-catchments Actually Measured for Percent Imperviousness Computations

Figure SI- Satellite Image % Impervious Pixel Map (included as a PDF file on the DVD)

TABLE IMP
SUBCATCHMENT (BASIN) IMPERVIOUSNESS

Subcatchment (Basin)	Average Imperviousness from Satelite Imagery	Actual Percent Imperviousness as Measured by Smith Engineering Company	Equation Adjusted Average Percent Imperviousness	Visually Adjusted Average Percent Imperviousness	Difference of Visually Adjusted % to Equation Adjusted %	Comment on Why Visually Adjusted the Percent Imperviousness
	%	%	%	%	%	%
**	(a)	(b)	(c)	(d)		
Alcalde Basin						
A1	47		60	no adjust.	---	---
A2	35		46	55	9	large parking lots & buildings
A3	30		40	no adjust.	---	---
A4	29	**50**	**50**	no adjust.	---	---
A5	42		55	no adjust.	---	---
A6	32		42	no adjust.	---	---
A7	40		52	no adjust.	---	---
A8	47	**57**	**57**	no adjust.	---	---
A9	45		58	no adjust.	---	---
A10	43		56	no adjust.	---	---
A11	53		67	no adjust.	---	---
A12	53	**53**	**53**	no adjust.	---	---
A13	51		65	70	5	significant commercial
A14-H	17		26	80	54	Sawmill Development mostly buitl now
A15	49		63	70	7	significant commercial
A16-C	5	**25**	**25**	no adjust.	---	---
A17-C	56		70	80	10	significant commercial & high density residential
A18	42		54	no adjust.	---	---
A19-C	61		76	80	4	significant buildings & asphalt
A20-C	9		16	10	-6	park - mostly grass
A21-C	15		23	60	37	significant buildings & asphalt
A22-0	35		46	no adjust.	---	---
A23-C	73		90	no adjust.	---	---
A24-0	50		63	no adjust.	---	---
Barelas Basin				no adjust.	---	---
B1	53		67	no adjust.	---	---
B2-0	44		57	no adjust.	---	---
B3	50		64	no adjust.	---	---
B4	48	**47**	**47**	no adjust.	---	---
B5	54		68	no adjust.	---	---
B6	54		69	65	-4	large open fields and unpaved lots
B7	56		70	56	-14	large bare ground and gravel areas
B8	50		64	no adjust.	---	---
B9-0	49		62	no adjust.	---	---
B10	50		64	no adjust.	---	---
B11	19	**19**	**19**	no adjust.	---	---
B12	55		70	no adjust.	---	---
B13	48		61	no adjust.	---	---
B14	62		78	85	7	mostly dense commercial

TABLE IMP
SUBCATCHMENT (BASIN) IMPERVIOUSNESS

Subcatchment (Basin)	Average Imperviousness from Satelite Imagery	Actual Percent Imperviousness as Measured by Smith Engineering Company	Equation Adjusted Average Percent Imperviousness	Visually Adjusted Average Percent Imperviousness	Difference of Visually Adjusted % to Equation Adjusted %	Comment on Why Visually Adjusted the Percent Imperviousness
	%	%	%	%	%	%
**	(a)	(b)	(c)	(d)		
B15	63		78	90	12	mostly dense commercial
B16	70		86	no adjust.	---	---
B17	67		83	90	7	mostly dense commercial
B18	80	**98**	**98**	no adjust.	---	---
B19.1	62		78	85	7	mostly dense commercial
B19.2	62		78	85	7	mostly dense commercial
B20	50		63	85	22	mostly dense commercial
B21	51		65	70	5	some dense urban - a little commercial
B22	46		59	70	11	some large buildings and parking lots
B23	77	**99**	**99**	no adjust.	---	---
B24	61		77	90	13	full commercial
B25	67	**96**	**96**	no adjust.	---	---
B26	60		75	no adjust.	---	---
B27	66		82	88	6	mostly dense commercial
B28	52		66	70	4	some commercial
B29	47		60	65	5	some commercial
B30	66		82	no adjust.	---	---
B31	69		85	no adjust.	---	---
B32	57		72	no adjust.	---	---
B33	53		68	no adjust.	---	---
B34	60		76	no adjust.	---	---
B35	66		82	no adjust.	---	---
B36	67	**77**	**77**	no adjust.	---	---
B37-C	12		19	5	-14	park - mostly grass
B38-C	18		27	5	-22	park - mostly grass
B39-0	49		62	30	-32	large open field
B40	67		84	no adjust.	---	---
B41	69	**94**	**94**	no adjust.	---	---
Broadway Basin				no adjust.	---	---
BR1	50		64	75	11	approx. half of basin is commercial
BR2	64		80	50	-30	Broadway & Lomas Pond bare soil bottom
BR3	52		66	no adjust.	---	---
BR4	47		60	75	15	I-25 & Lomas Aspahlt and significant commercial
BR5	44	**59**	**59**	no adjust.	---	---
BR6	65		82	no adjust.	---	---
BR7-H1	20		29	85	56	commercial - TriCore Labs / Embassy Suites
BR7-H2	21		30	80	50	commercial - TriCore Labs / Embassy Suites

TABLE IMP
SUBCATCHMENT (BASIN) IMPERVIOUSNESS

Subcatchment (Basin)	Average Imperviousness from Satelite Imagery	Actual Percent Imperviousness as Measured by Smith Engineering Company	Equation Adjusted Average Percent Imperviousness	Visually Adjusted Average Percent Imperviousness	Difference of Visually Adjusted % to Equation Adjusted %	Comment on Why Visually Adjusted the Percent Imperviousness
	%	%	%	%	%	%
**	(a)	(b)	(c)	(d)		
BR8-H1	34		45	no adjust.	---	---
BR8-H2	48	64	64	no adjust.	---	---
BR9	69		86	no adjust.	---	---
BR10	47	31	31	no adjust.	---	---
BR11	38		50	65	15	significant asphalt in Indial School Rd. & Odelia
BR12	15		23	10	-13	cemetary mostly grass & bare soil
BR13	50		63	70	7	significant commercial
BR14	72	89	89	no adjust.	---	---
BR15-C	8		15	0	-15	park - all grass
BR16	13	13	13	no adjust.	---	---
BR17	46		59	no adjust.	---	---
BR18	53		67	75	8	significant commercial
BR19	50		64	75	11	approx. 25% of basin is commercial
BR20	66		82	90	8	mostly commercial
BR21	56		71	80	9	significant commercial

Basic Statistics

Total Number of Basins =	88
Number of basins where Visual Adjustments were applied =	38
% of Basins where visual adjustment were applied =	43

Statistics on Visual Adjustment Increases Compared to Equation Adjustment

Number of Basins where Visual Adjustment was greater than Equation Adjustment =	29
Positive range of % increase = 4% to 56 %	
Average % Visual Adjustment Increase Above Equation Adjustment	14

Statistics on Visual Adjustment Decreases compared to Equation Adjustment

Number of Basins where Visual Adjustment was less than Equation Adjustment =	9
Negative range of % decrease = - 4% to - 32 %	
Average % Visual Adjustment Decrease	-17

Additional Basic Statistics

% of Basins with Visual Adjustments as Postive Increases	76
% of Basins with Visual Adjustments as Negative Increases	24

TABLE IMP
SUBCATCHMENT (BASIN) IMPERVIOUSNESS

Subcatchment (Basin)	Average Imperviousness from Satelite Imagery	Actual Percent Imperviousness as Measured by Smith Engineering Company	Equation Adjusted Average Percent Imperviousness	Visually Adjusted Average Percent Imperviousness	Difference of Visually Adjusted % to Equation Adjusted %	Comment on Why Visually Adjusted the Percent Imperviousness
	%	%	%	%	%	%
**	(a)	(b)	(c)	(d)		

** - C = closed basin - not modeled, H= hydrograph computed external to SWMM, O = basin drains out of study area and not modeled

(a) Determination of imperviiousness was determined from satellite imagery, basin areas here may be slightly different due to pixel size utilized (30 ft x 30 ft) as compared to basin areas as delineated in AutoCad for the drainage basin maps

(b) Areas measured in AutoCad on the Drainage Basin Maps

(c) Adjustment Equation = Adj. % Imp. = 1.162 (Average % Imp. from Sat. Imag.) + 5.4656 as developed by Smith Engineering Company by comparison of actual percent imperviousness as measured by SEC for 15 drainage basins to Average Satelite Imagery % Imperviousness. See Appendix for documentation of basins adopted for analysis and comparision and equations / graphts

(d) Visual Adjustment based on the Orthophotography shown on the Drainage Basin Maps

TABLE I1

SUMMARY OF 15 SUBCATCHMENTS - Imperviousness Measurements - Actual vs. Satellite Imagery

Mid Valley Drainage Management Plan

	Subcatchment (Basin) No.	Imperviousness Measured by Smith Engineering Company	Imperviousness Computed from NLCD from Satellite Imagery	Difference of Measured to Computed % Values	Imperviousness Computed by Smith Engineering Company Using a Linear Equation	Imperviousness Computed by Smith Engineering Company Using a Polynomial Equation
					R^2 = 0.9043	R^2 = 0.9163
		% (a)	% (b)	%	% (c)	% (d)
1	B4	47	48	-1	61	58
2	A12	53	53	0	67	64
3	B11	19	19	0	28	28
4	BR16	13	13	0	21	23
5	A8	57	47	10	60	57
6	B36	77	67	10	83	83
7	BR5	59	44	15	57	53
8	BR8-H2	64	48	16	61	58
9	BR14	89	72	17	89	91
10	B18	98	80	18	98	104
11	A16-C	25	5	20	11	17
12	A4	50	29	21	39	37
13	B23	99	77	22	95	99
14	B41	94	69	25	86	86
15	B25	96	67	29	83	83

SUMMARY OF % Differences

1 Basin with Less than Satellite Imagery and Value	-1
3 Basins with Same Value as Satellite Imagery	0
11 Basins with Greater than Satellite Imagery and Average Greater Value	20

Number of Basins with differneces different values = 12
basin out of 15 basins = 80 %

a & b - Data obtained from Table I2

c- Data obtained from linear equation derived in Graph 1

d- Data obtained from polynomial equation derived in Graph 2

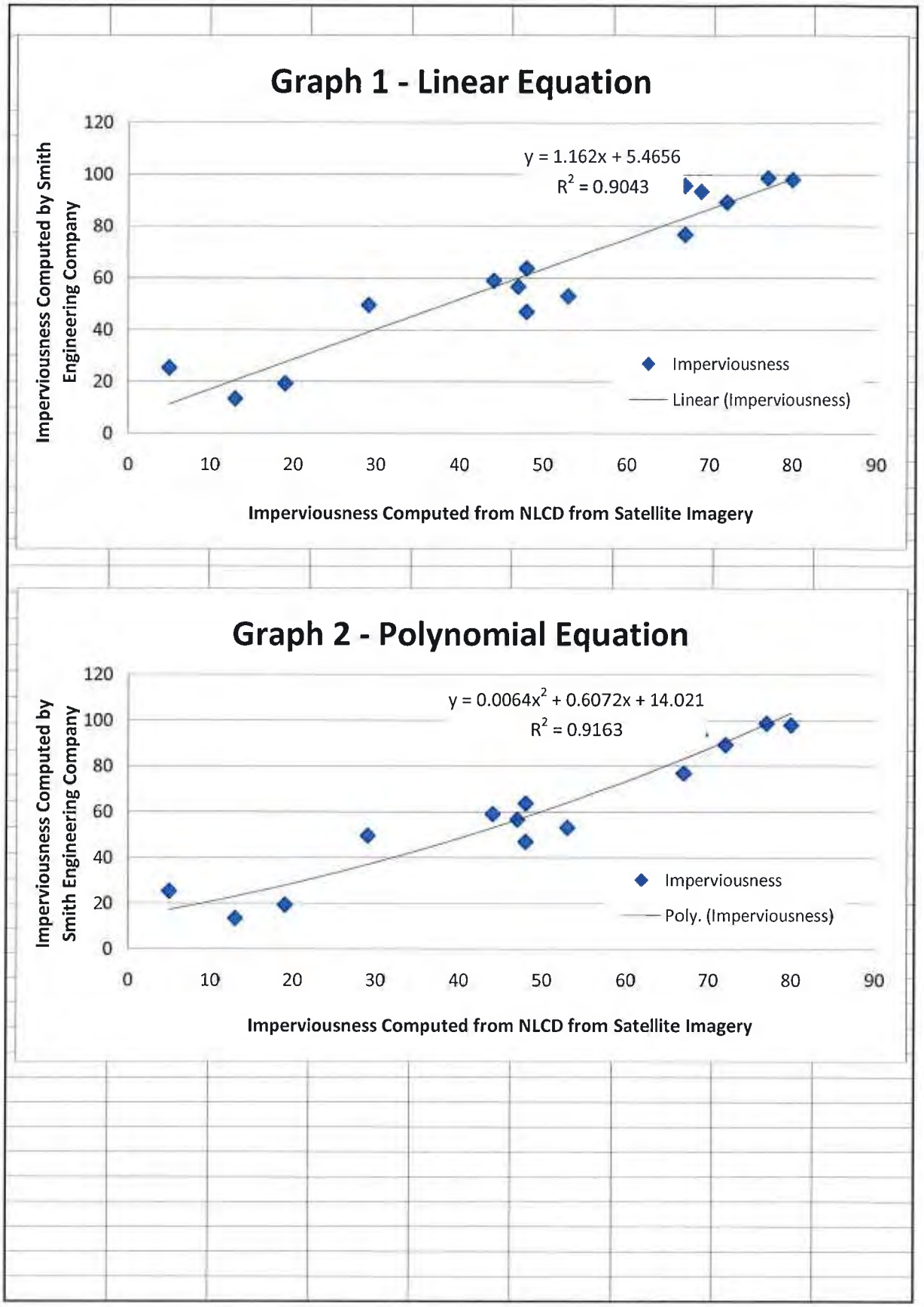

Graph 1 - Linear Equation
y = 1.162x + 5.4656
R² = 0.9043
Imperviousness Computed by Smith Engineering Company
Imperviousness Computed from NLCD from Satellite Imagery
Imperviousness
Linear (Imperviousness)
0
20
40
60
80
100
120
0
10
20
30
40
50
60
70
80
90
Graph 2 - Polynomial Equation
y = 0.0064x² + 0.6072x + 14.021
R² = 0.9163
Imperviousness Computed by Smith Engineering Company
Imperviousness Computed from NLCD from Satellite Imagery
Imperviousness
Poly. (Imperviousness)

TABLE I2

15 SUBCATCMENTS - IMPERVIOUSNESS MEASUREMENTS (actual) vs. SATELLITE IMAGERY

Mid Valley Drainage Management Plan

Subcatchment (Basin) No.	Type	Total Basin Area	Pervious Area		Impervious Area						Imperviousness Computed by Smith Engineering Company	Imperviousness Computed from NLCD from Satellite Imagery	%Error	Comments
			Grass	Dirt	Asphalt / Concrete	Roof	Driveway	Sidewalk	Street	Total				
		(ft^2)	(ft^2)	(ft^2)	(ft^2)	(ft^2)	(ft^2)	(ft^2)	(ft^2)	(ft^2)	%	%	%	
	a	b	b	b	b	b	b	b	b	b				
BR8-H2	R+CI	1,188,070	185,382	–	278,421	340,564	–	26,824	111,505	757,314	63.7	48	24.7	–
BR14	CI	862,387	–	91,751	–	–	–	–	–	770,636	89.4	72	19.4	–
BR16	Cemetery	1,127,866	898,984	77,357	–	23,952	–	–	127,573	151,525	13.4	13	3.2	–
BR5	I25&Mountain	467,487	–	177,583	–	14,019	–	–	–	275,885	59.0	44	25.4	
B18	CI	608,804	–	–	–	–	–	–	–	596,628	98.0	80	18.4	–
B23	CI	407,381	5,454	–	–	–	–	–	–	401,927	98.7	77	22.0	–
B11	Tingley	540,693	–	–	–	–	–	–	104,439	104,439	19.3	19	1.6	–
B41	I40	1,081,228	–	68,258	–	68,030	–	–	944,940	1,012,970	93.7	69	26.4	–
B25	CI	1,727,367	–	–	–	–	–	–	–	1,658,272	96.0	67	30.2	–
B36	CI	1,103,520	–	–	543,088	212,967	–	7,345	84,938	848,338	76.9	67	12.8	Typical sidewalk width = 4 ft
B4	R	260,538	–	–	–	69,434	6,804	11,002	35,030	122,270	46.9	48	-2.3	Numbers of residences = 28. Typical driveway area = 243ft^2. Typical sidewalk width = 4 ft
A4	R	540,886	273,006	–	102,142	85,883	18,197	10,062	51,596	267,880	49.5	29	41.4	Numbers of residences = 31. Typical driveway area = 587ft^2. Typical sidewalk width = 4 ft
A8	R	961,392	–	–	84,851	214,424	54,684	38,657	151,631	544,247	56.6	47	17.0	Numbers of residences = 124. Typical driveway area = 441ft^2. Typical sidewalk width = 4 ft
A12	R+CI	4,677,990			1,363,904	510,615	119,160	92,405	395,501	2,481,585	53.0	53	0.1	Numbers of residences = 360. Typical driveway area = 331ft^2. Typical sidewalk width = 4 ft
A16-C	Park	28,358	–	–	7,174	–	–	–	–	7,174	25.3	5	80.2	–

a - R = residential, CI = commercial + industrial

b - Measured in AutoCad on the Drainage Basin Maps

NOTES

1- BASIN A14H is the Sawmill Area and was just recently developed, the Satellite Imagery data states it is 2001 THEREFORE, comparison of this basin with the others is not appropriate

A14-H	R+CI	1,994,005	–	–	–	72,681	–	64,638	40,762	178,081	8.9	17	-90.4	Don't include in data set to to tremendous error - see NOTE 1

2- BASIN BR 10 results from the Satellite Imagery data are considered an outlier, THEREFORE, comparison of this basin with the others is not appropriate

BR10	R	1,593,464	–	–	101,645	226,436	47,736	31,200	81,466	488,483	30.7	47	-53.3	Don't Include in Data Set due to tremendous error See NOTE 2 - Numbers of residences = 156. Typical driveway area = 306ft^2. Typical sidewalk width = 4 ft

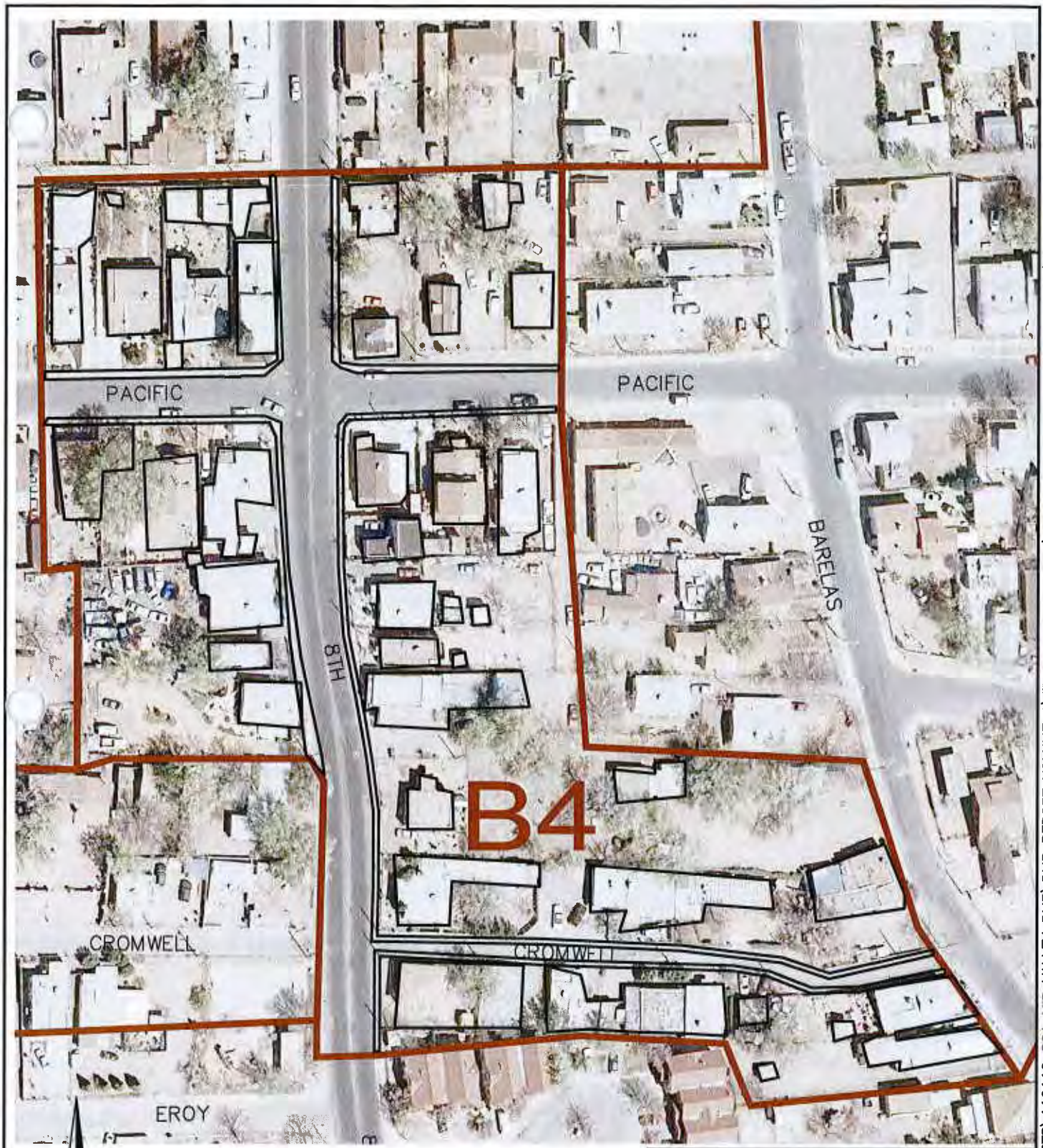
Fifteen Figures (orthophotographs)

(next 15 pages)

that document the 15 Subcatchments

Actually Measured for

Percent Imperviousness Computations



MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

MID VALLEY DRAINAGE MANAGEMENT PLAN

FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN B4

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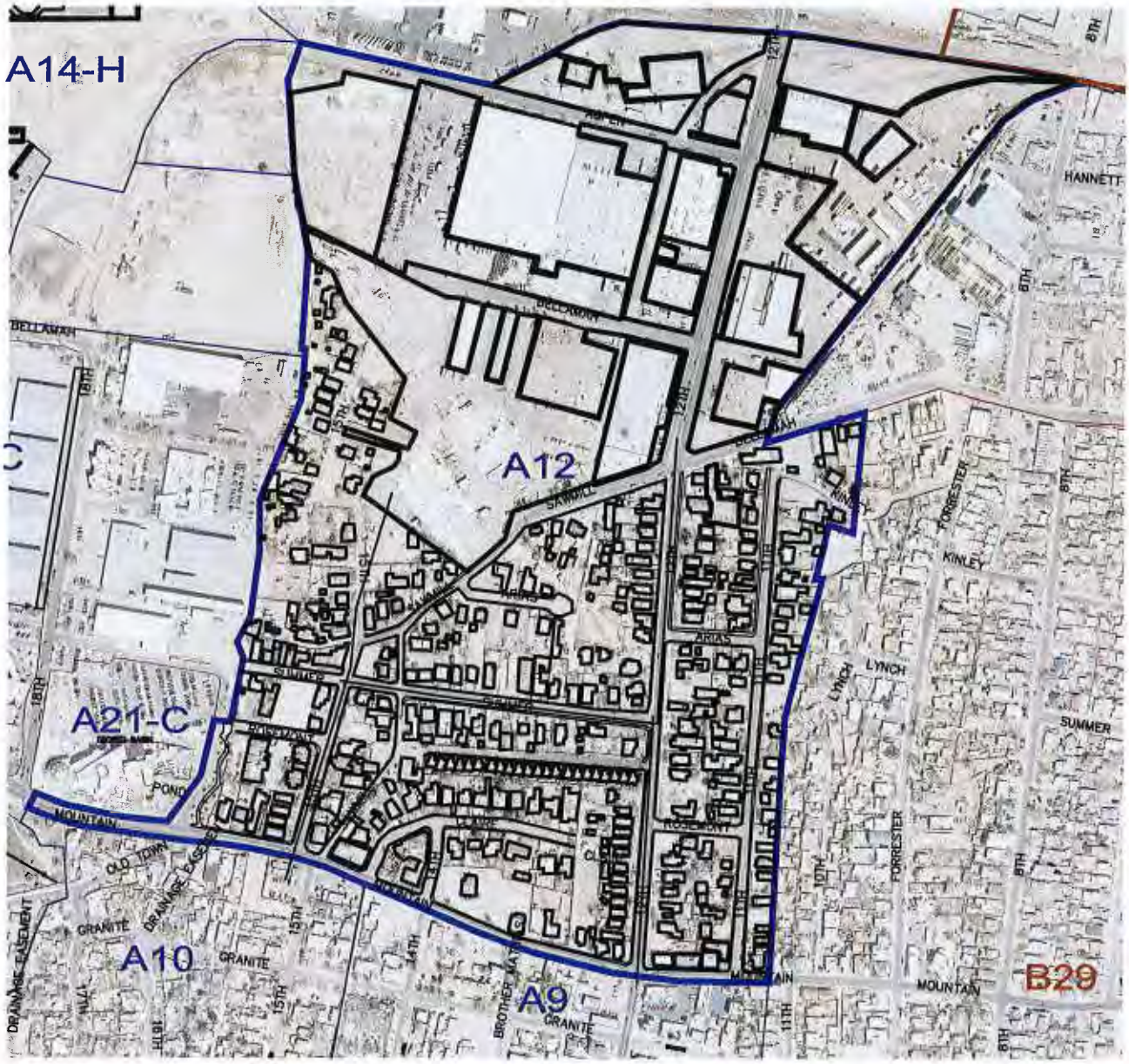

MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 500'

500' 0 500' 1000' 1500' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN
FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY
JUNE – 2011
SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN A12

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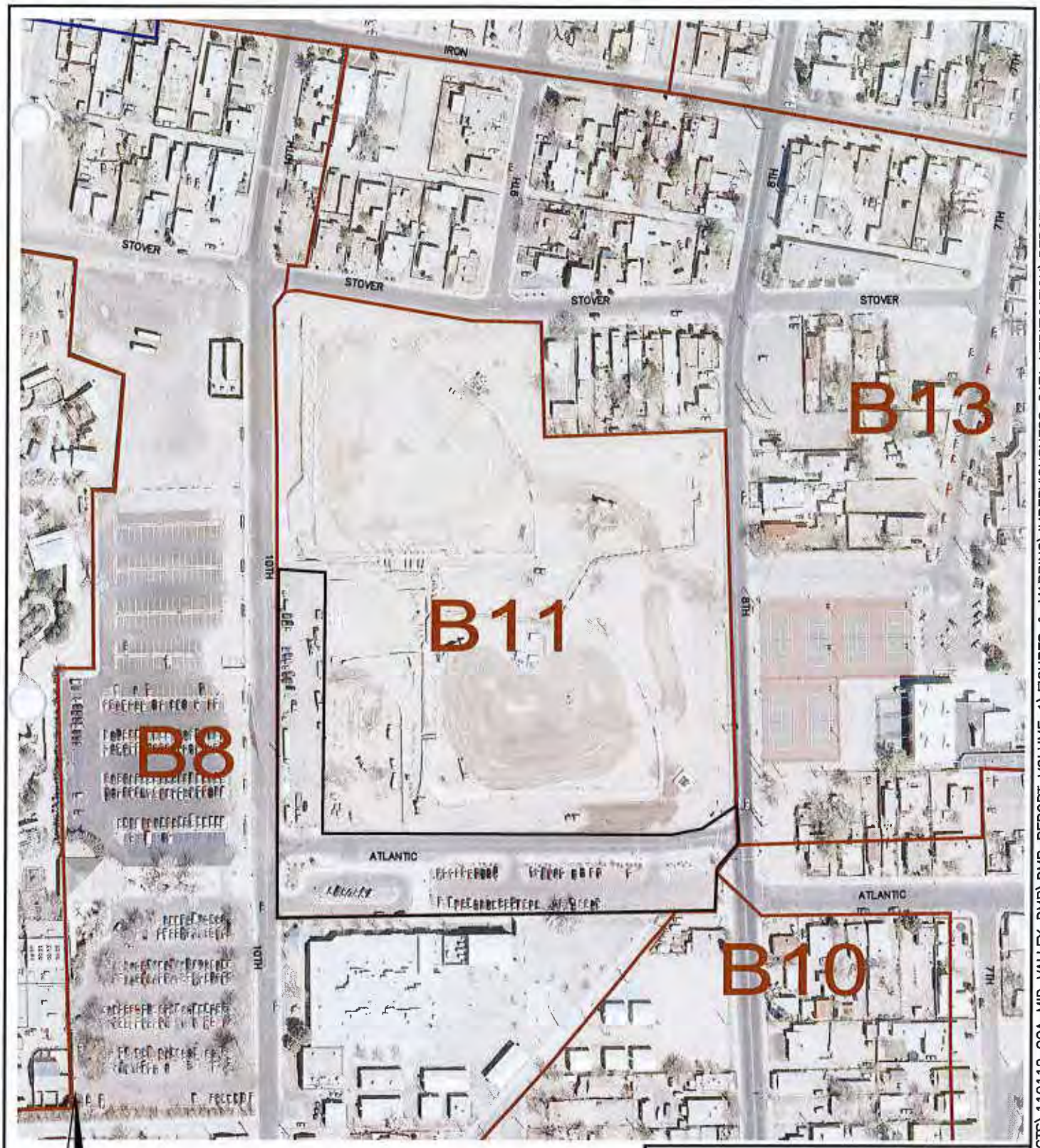

MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 200'

200' 0 200' 400' 600' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

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IMPERVIOUS AREAS BASIN B11

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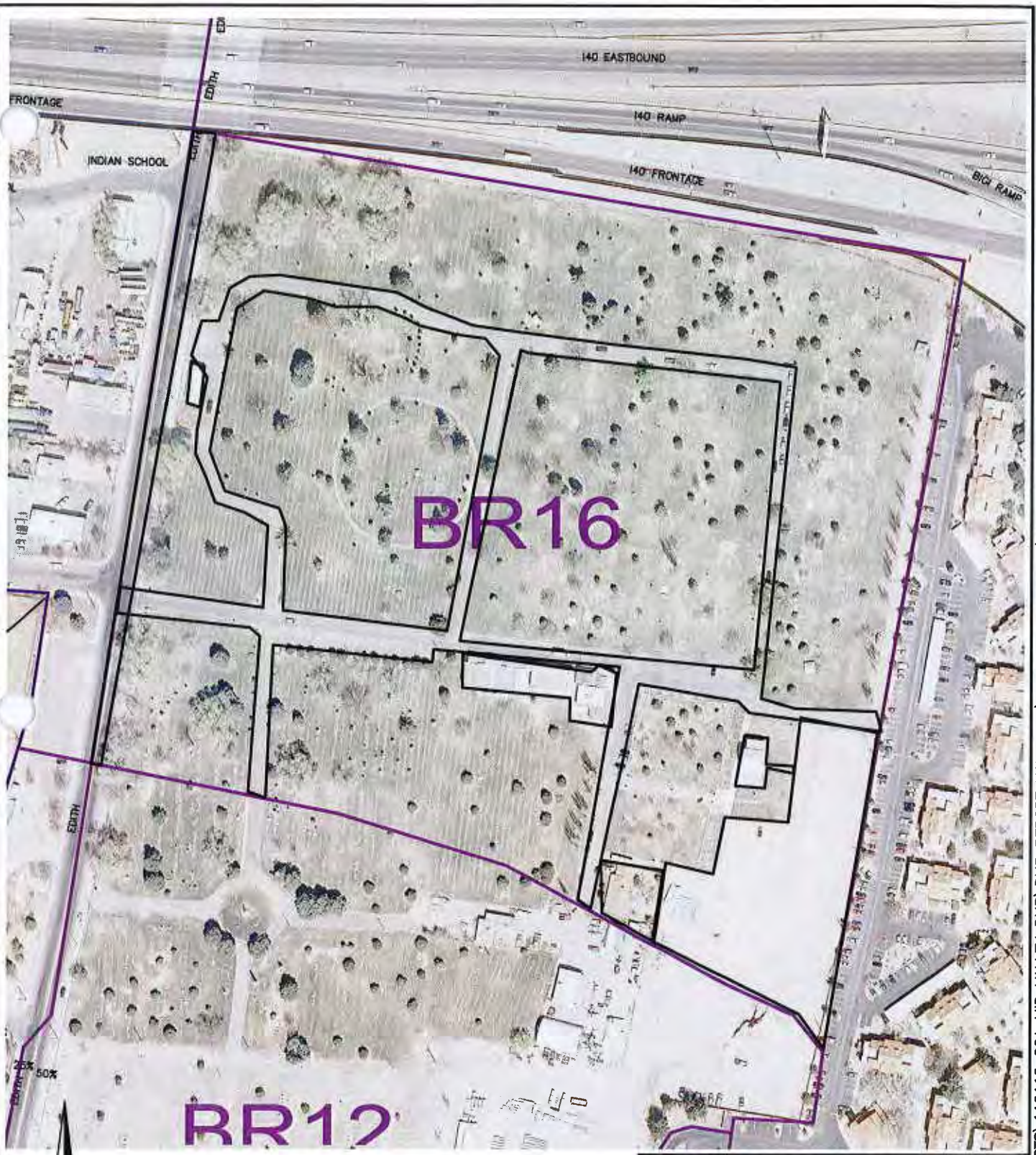

MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 200'

200' 0 200' 400' 600' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

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IMPERVIOUS AREAS BASIN BR16

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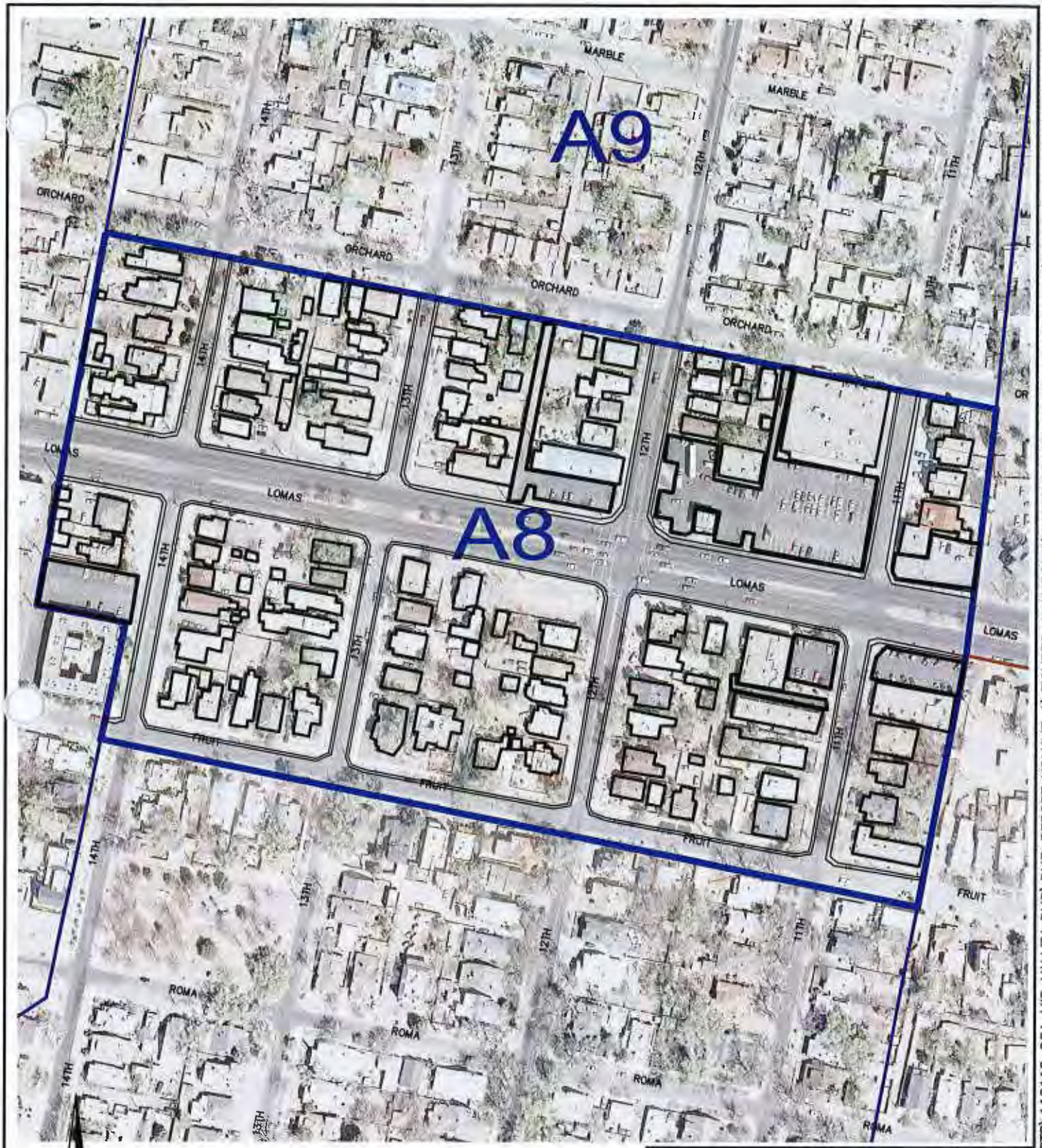

MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 200'

200' 0 200' 400' 600' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN A8

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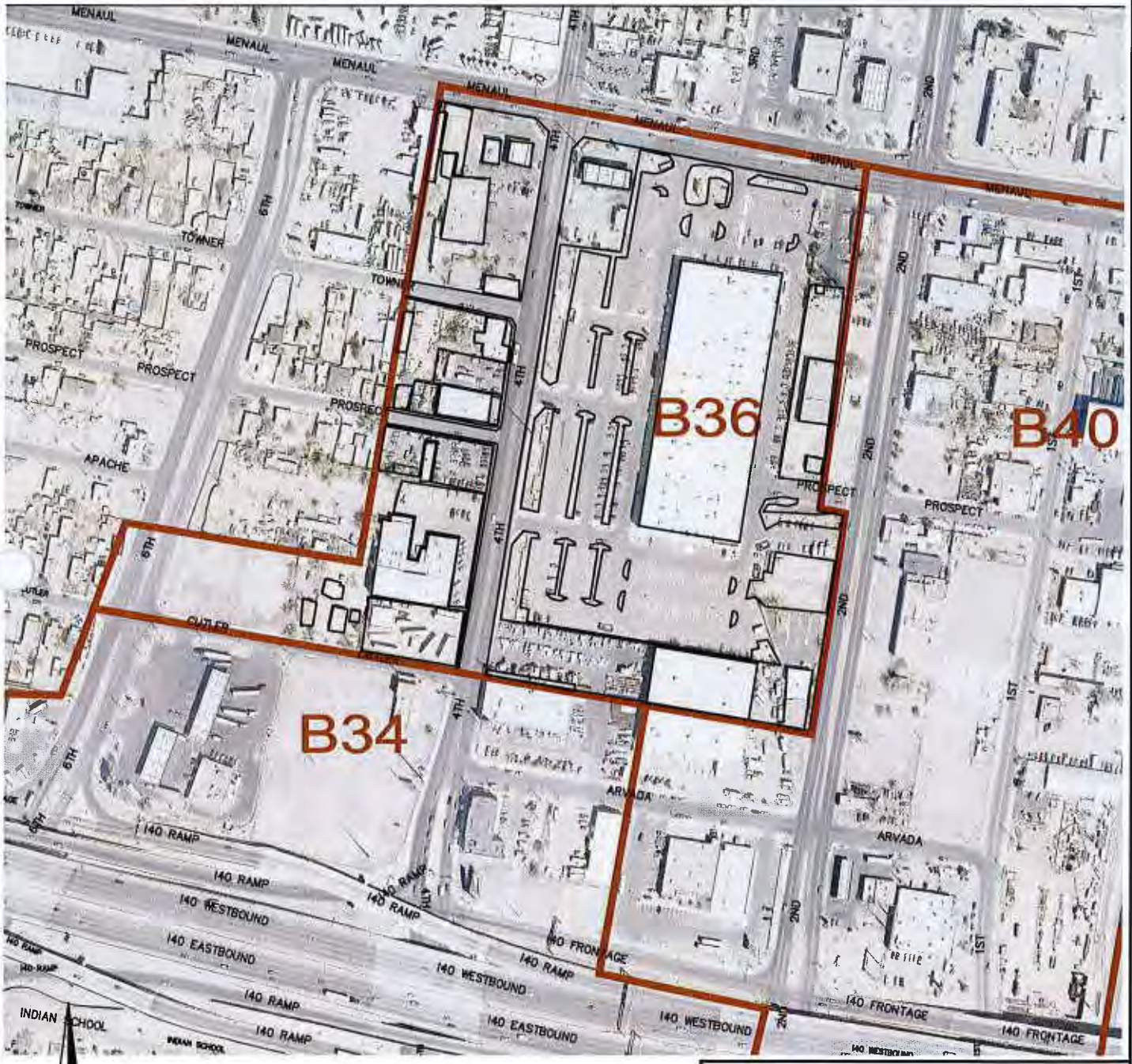

MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 300'

300' 0 300' 600' 900' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN B36

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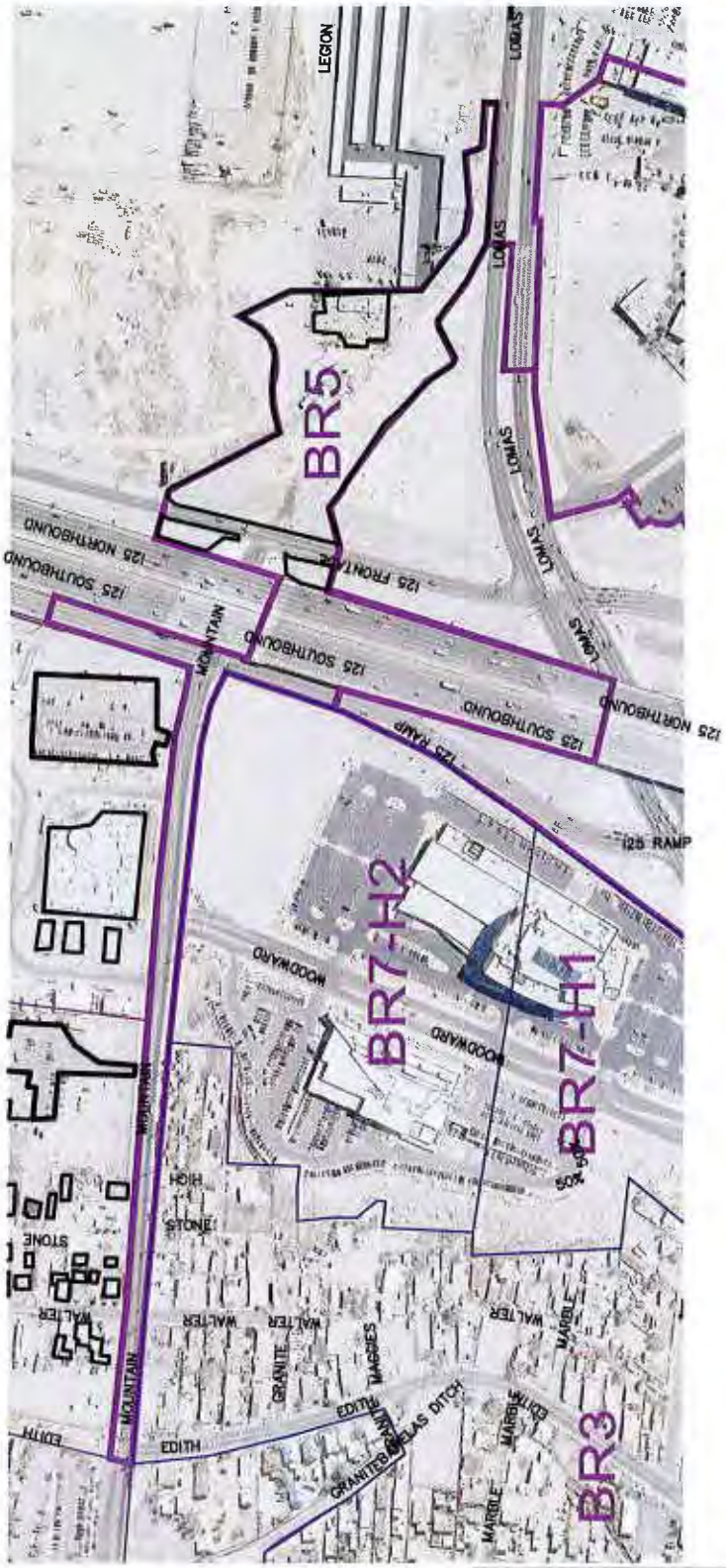

MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 400'

400' 0 400' 800' 1200' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN BR5

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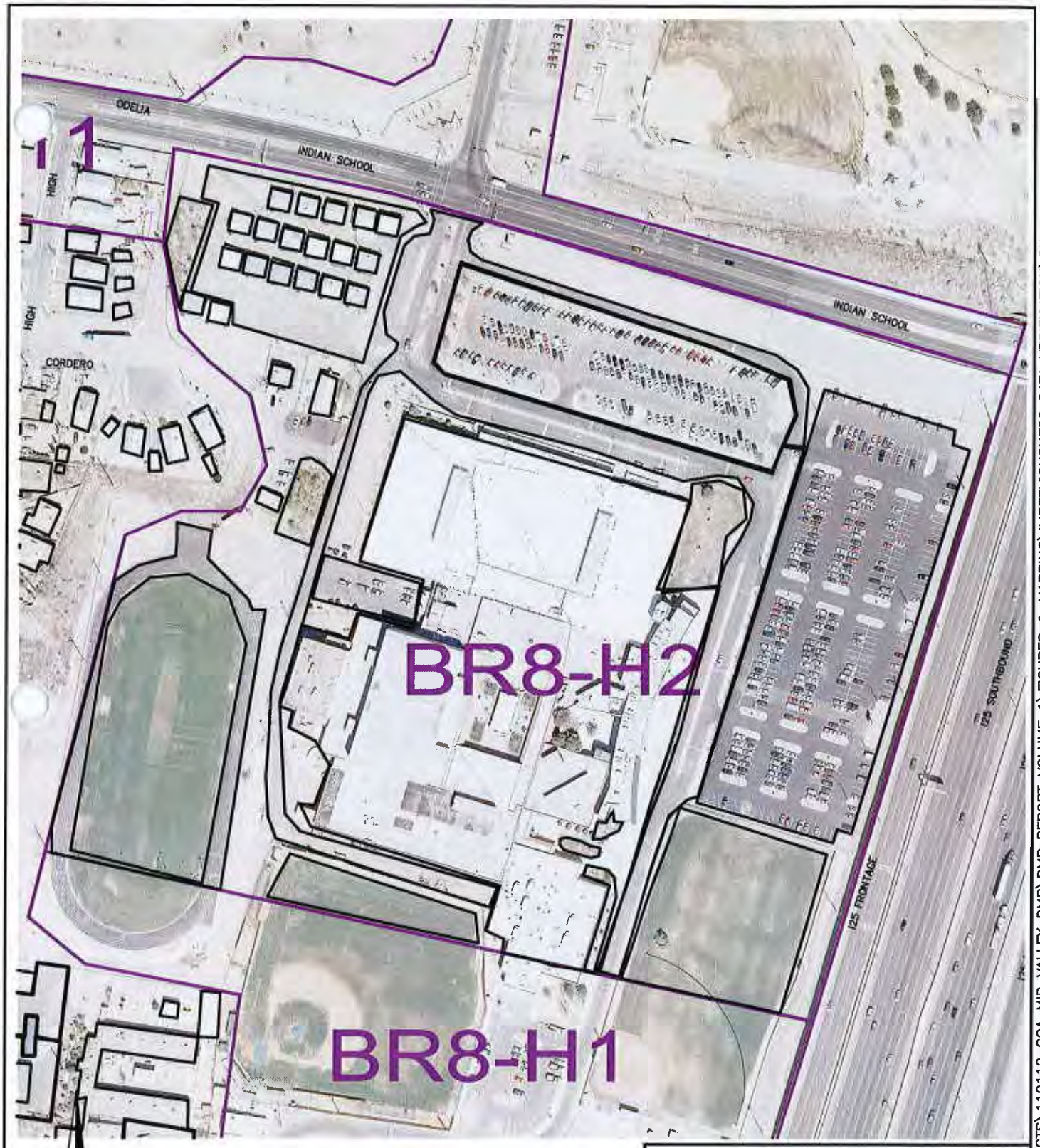


MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 200'

200' 0 200' 400' 600' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

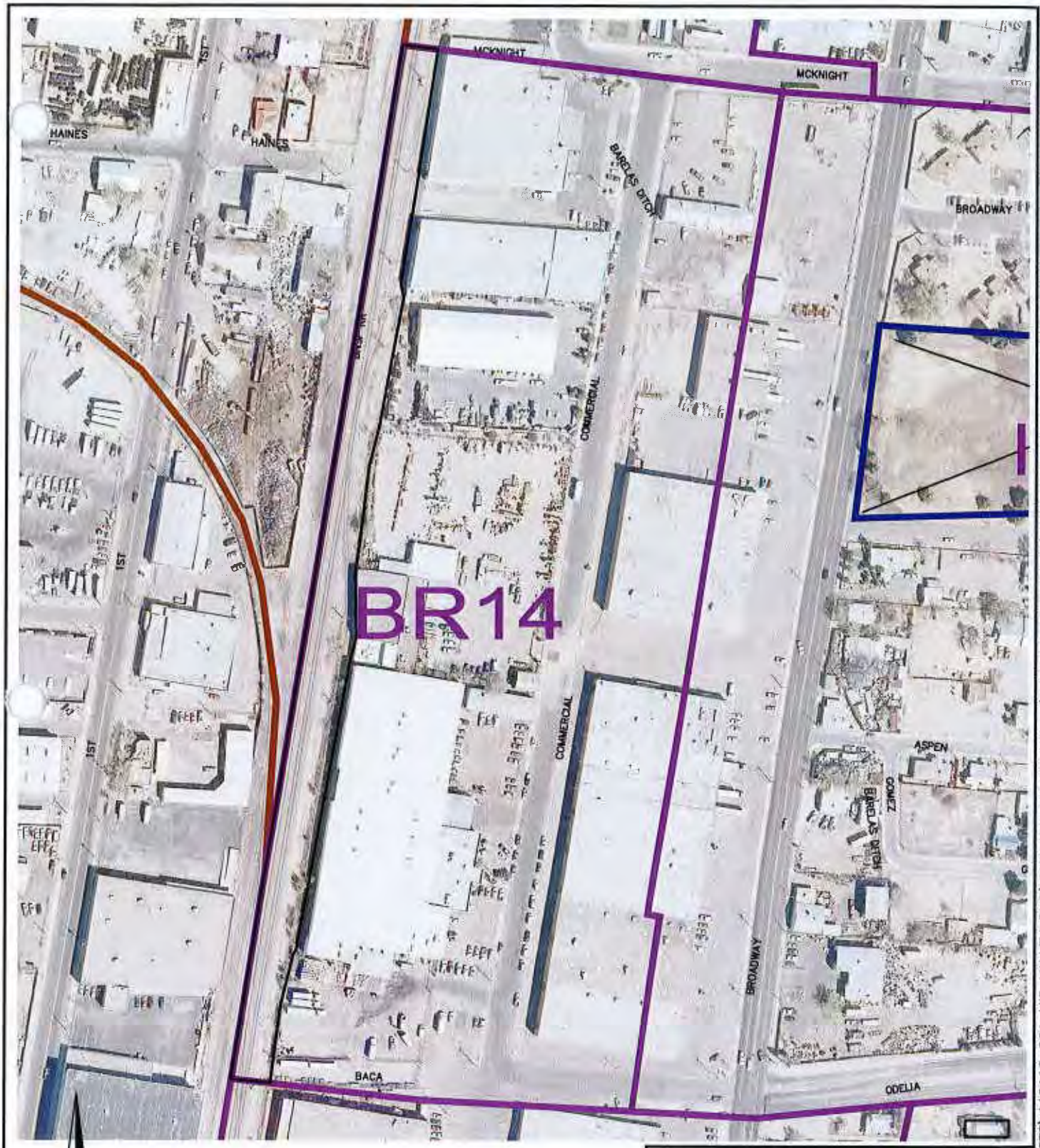
FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN BR8–H2

Q:\SEC---PROJECTS\2010 PROJECTS\110112 COA MID VALLEY DMP\DMP REPORT VOLUME 1\FIGURES & MAPPING\IMPERVIOUSNESS DATA VERIFICATION\PERCENT IMPERVIOUSNESS VERIFIC



MEASURED PERVIOUS AREAS

ARE OUTLINED IN BLACK

SCALE: 1" = 200'

200' 0 200' 400' 600' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

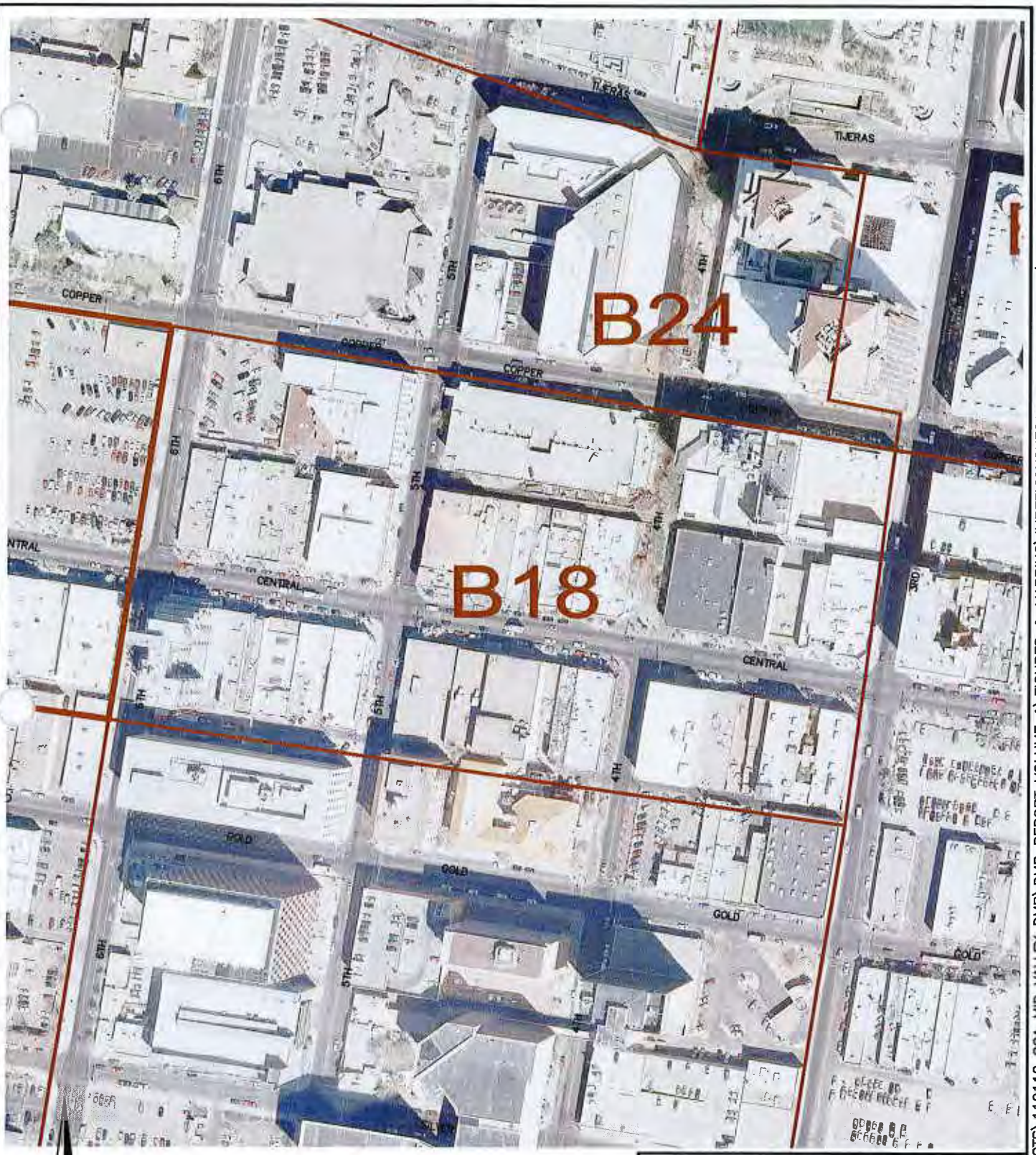
FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN BR14

Q:\SEC----PROJECTS\2010 PROJECTS\110112 COA MID VALLEY DMP\DMP REPORT VOLUME 1\FIGURES & MAPPING\IMPERVIOUSNESS DATA VERIFICATION\PERCENT IMPERVIOUSNESS VERIFIC



ASSUME 98% IMPERVIOUS

SCALE: 1" = 200'

200' 0 200' 400' 600' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

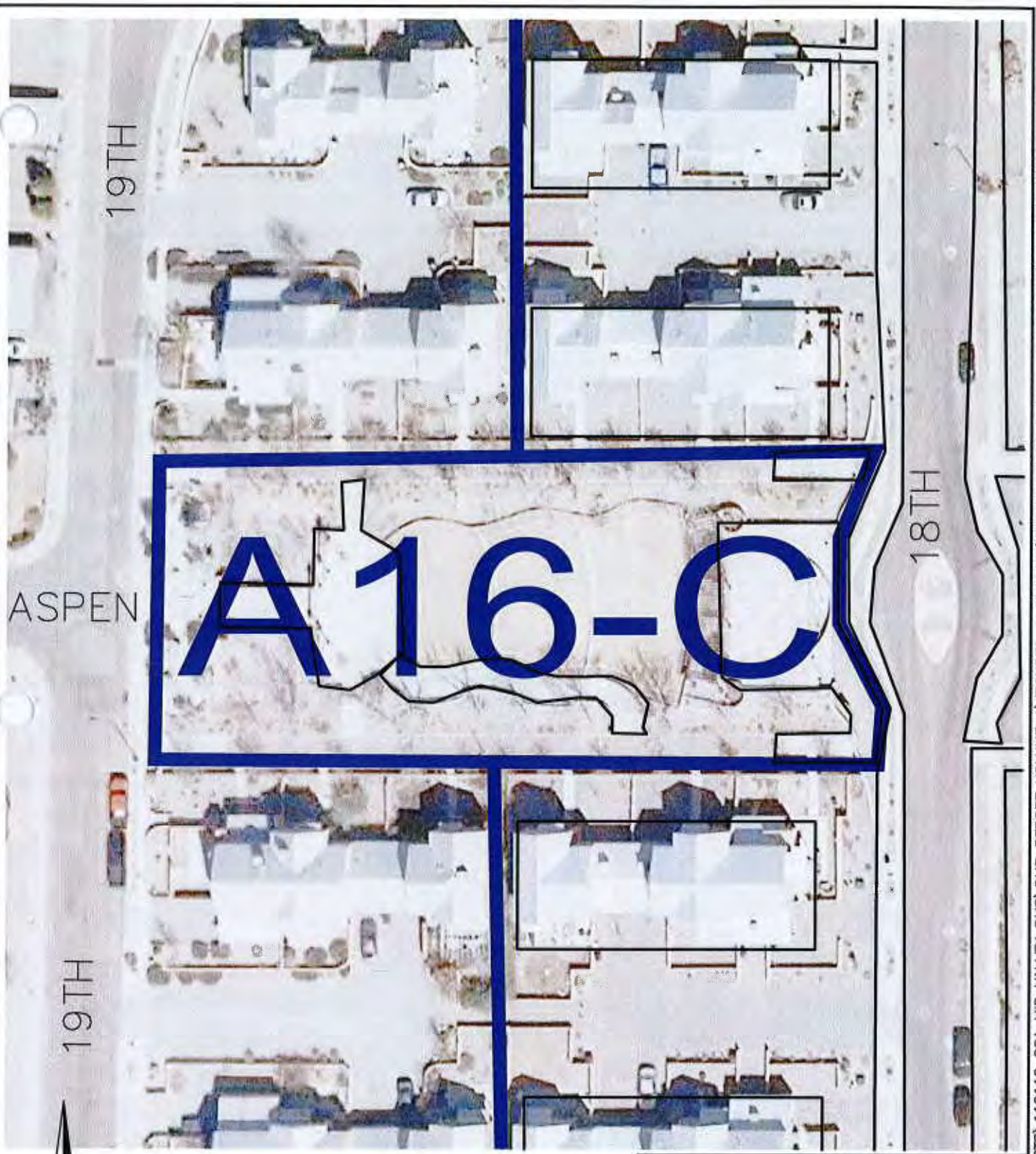
FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN B18

Q:\SEC---PROJECTS\2010 PROJECTS\110112 COA MID VALLEY DMP\DMP REPORT VOLUME 1\FIGURES & MAPPING\IMPERVIOUSNESS DATA VERIFICATION\PERCENT IMPERVIOUSNESS VERIFIC



MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 50'

50' 0 50' 100 150' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

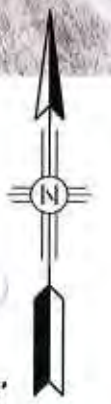
FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN A16–C

Q:\SEC---PROJECTS\2010 PROJECTS\110112 COA MID VALLEY DMP\DMP REPORT VOLUME 1\FIGURES & MAPPING\IMPERVIOUSNESS DATA VERIFICATION\PERCENT IMPERVIOUSNESS VERIFIC



MEASURED IMPERVIOUS AREAS ARE OUTLINED IN BLACK

SCALE: 1" = 200'

200' 0 200' 400' 600' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN A4

Q:\SEC---PROJECTS\2010 PROJECTS\110112 COA MID VALLEY DMP\DMP REPORT VOLUME 1\FIGURES & MAPPING\IMPERVIOUSNESS DATA VERIFICATION\PERCENT IMPERVIOUSNESS VERIFIC

MEASURED PERVIOUS AREAS

ARE OUTLINED IN BLACK

SCALE: 1" = 200'

200' 0 200' 400' 600' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

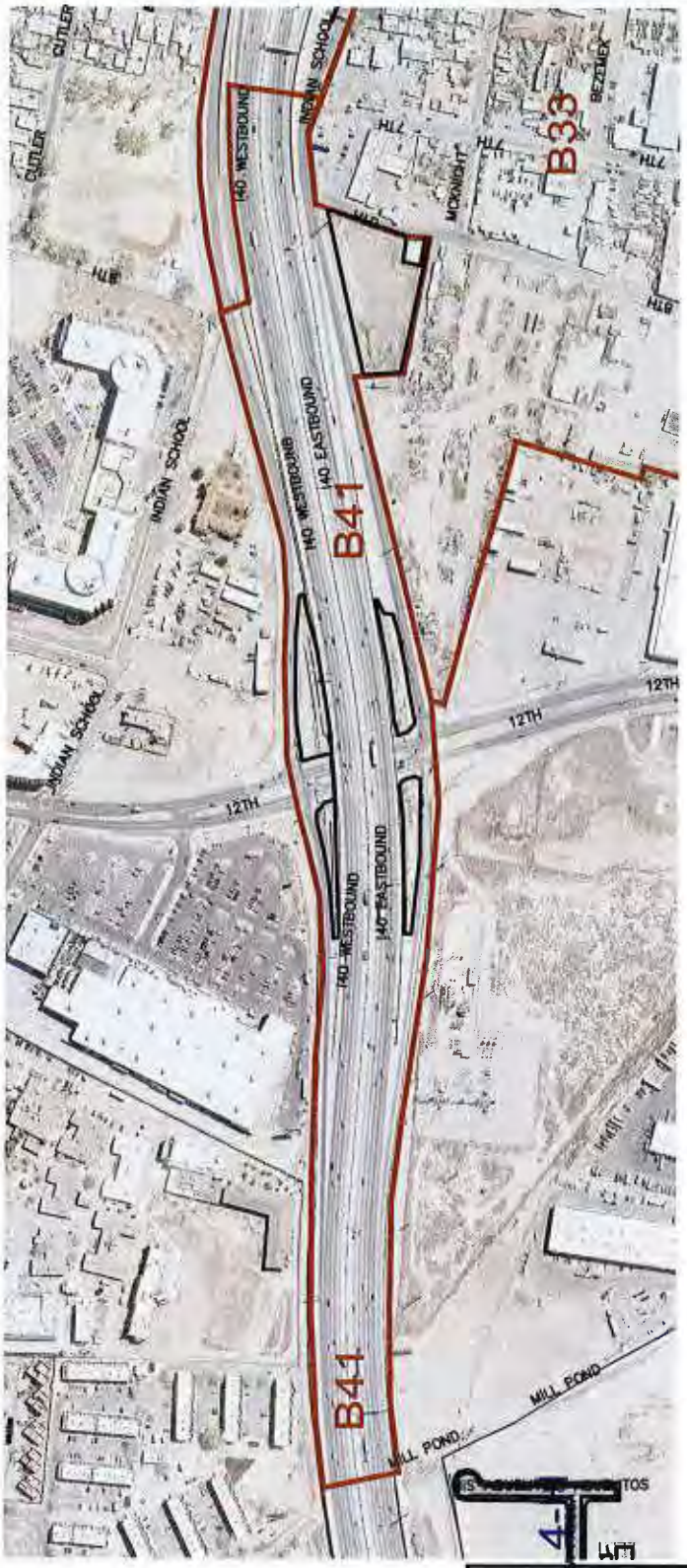
FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN B23

Q:\SEC---PROJECTS\2010 PROJECTS\110112 COA MID VALLEY DMP\DMP REPORT VOLUME 1\FIGURES & MAPPING\IMPERVIOUSNESS DATA VERIFICATION\PERCENT IMPERVIOUSNESS VERIFIC



MEASURED PERVIOUS AREAS

ARE OUTLINED IN BLACK

SCALE: 1" = 500'

500' 0 500' 1000' 1500' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

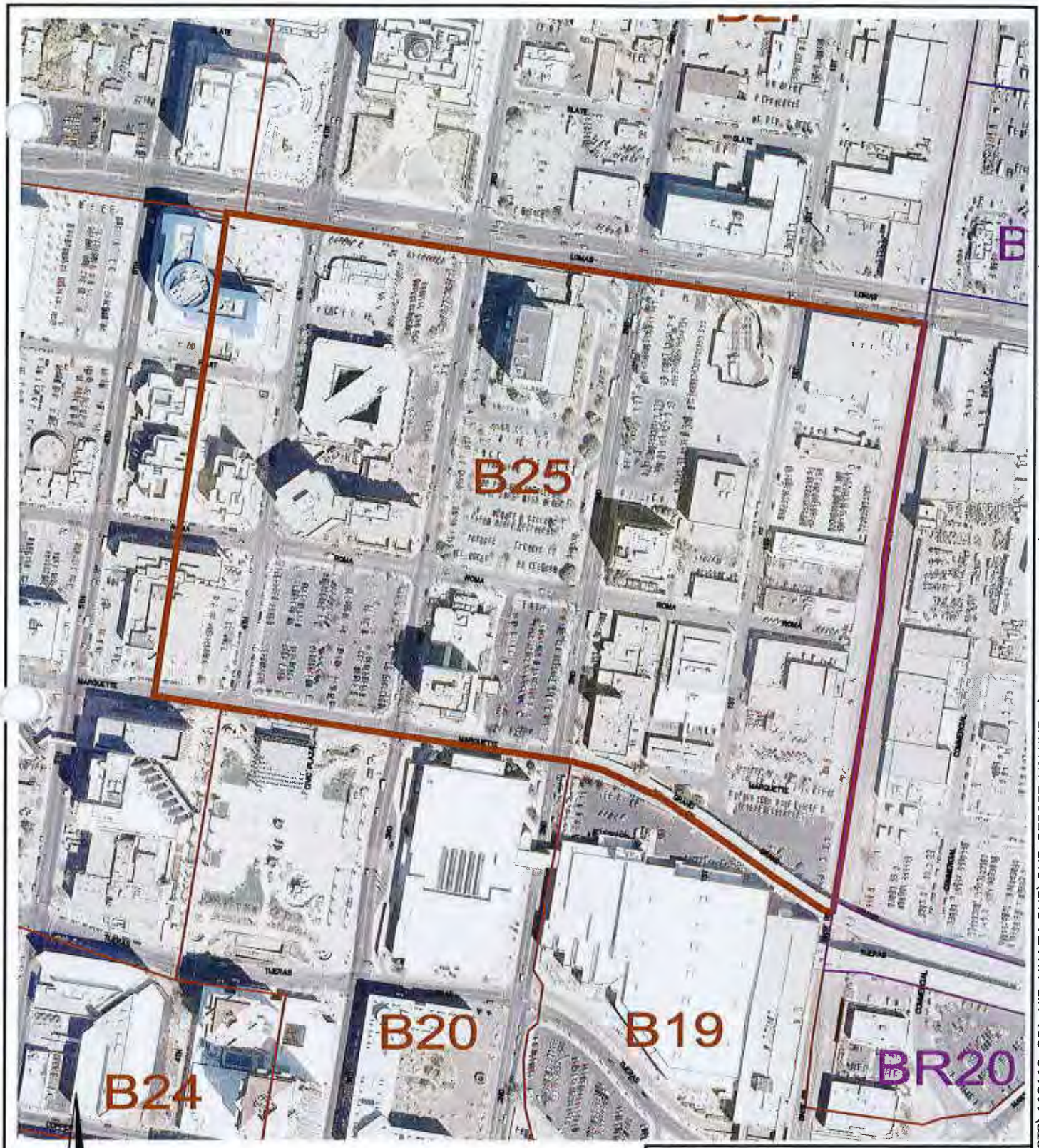
FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN B41

Q:\SEC----PROJECTS\2010 PROJECTS\110112 COA MID VALLEY DMP\DMP REPORT VOLUME 1\FIGURES & MAPPING\IMPERVIOUSNESS DATA VERIFICATION\PERCENT IMPERVIOUSNESS VERIFIC



ASSUME 96% IMPERVIOUS

SCALE: 1" = 300'

300' 0 300' 600' 900' Feet

MID VALLEY DRAINAGE MANAGEMENT PLAN

FOR THE CITY OF ALBUQUERQUE & ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

JUNE – 2011

SEC PROJECT NO. 110112

IMPERVIOUS AREAS BASIN B25

Q:\SEC---PROJECTS\2010 PROJECTS\110112 COA MID VALLEY DMP\DMP REPORT VOLUME 1\FIGURES & MAPPING\IMPERVIOUSNESS DATA VERIFICATION\PERCENT IMPERVIOUSNESS VERIFIC