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City Of Amarillo Drainage Utility Study

Prepared for:

City of Amarillo
509 S.E. 7th Avenue
Amarillo, Texas 79101

Project No. 11020.00
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Executive Summary

A Drainage Utility study has been conducted by Espey Consultants, Inc. (now doing business as RPS Espey) for the City of Amarillo, which began in May 2011. The study consists of four major work elements as follows:

1. Needs assessment for 1) drainage infrastructure operations and maintenance, 2) drainage management capital improvement plans, and 3) technical criteria for design of new drainage infrastructure and for upgrade of existing drainage infrastructure.
2. Development of a customer billing rate structure for assigning Drainage Utility user-fees in compliance with the requirements of the Texas Local Government Code. Additionally, the capability of the City utility billing system to accommodate the utility charge was confirmed.
3. Cost-of-Service financial analysis to establish affordable Drainage Utility customer billing rates while providing sufficient revenue to support: 1) a pro-active drainage infrastructure operations and maintenance program, 2) drainage management capital improvement projects design and construction, and 3) accrue a reserve fund for repair/replacement of existing drainage infrastructure and for infrastructure construction required by new land development activity.
4. Coordination with the City Commission and the Comprehensive Plan Implementation Advisory Committee, and provision of information on the Drainage Utility to the public through public meetings and City web site assessable materials.

Needs Assessment Findings

1. **Infrastructure Maintenance:** The City has an extensive drainage infrastructure system in place. The system includes over 3,300 storm drain inlets, more than 180 miles of storm drain piping and culverts, 15 miles of constructed ditch/channels and 20 playa lakes; the replacement cost of the current infrastructure inventory is estimated at $160,000,000. To convey storm water runoff at design capacity, this infrastructure requires regular debris/trash/sediment/vegetation removal and replacement/rehabilitation before structural failure. The City's current drainage infrastructure operations and maintenance program is conducted by the Street Department primarily in response to system failures and citizen problem reports. *There is a need for a dedicated work group to provide pro-active, focused drainage infrastructure maintenance services*.
2. **Capital Improvements Program:** The City completed the Storm Water Management Master Plan (Master Plan) in 1993 which identified drainage improvement projects to

reduce flood hazards throughout the City. Since the completion of the Master Plan, the City has identified additional drainage improvement projects. Currently, there are a total of fifty-five (55) projects for which preliminary engineering evaluation and cost estimates have been completed. The total design and construction cost for these projects is estimated at approximately $66,000,000 in year 2011 dollars. The City has constructed only four (4) of the recommended projects since the completion of the Master Plan in 1993. *The lack of stable funding has severely limited implementation progress for the identified capital improvement projects.*

3. **Drainage Infrastructure Design Criteria:** The City's current design requirements for street drainage capacity are less stringent than other large west Texas municipalities. It is recommended that the City adopt increased street drainage capacity requirements for new development and for future flood-hazard-reduction drainage projects. This will allow the City to better manage street water depth and overflow conditions that occur during large storm events to improve roadway drivability and first responder access. *It is recommended that the City increase curb-to-curb drainage capacity requirements from the current 2-year storm up to the 5 or 10-year storm and require that right-of -way beyond the curb line be sloped toward the roadway surface to prevent overflow into surrounding areas up to the 100-year storm event*. Providing a 5-year curb-to-curb level of service will increase storm drain infrastructure costs by approximately 25 percent; 10-year level of service increases costs by approximately 40 percent. The current CIP project backlog is sized for 2-year service level curb-to-curb. Therefore, CIP costs will increase with the adoption of a higher design standard.

The Drainage Utility

A Drainage Utility is a user-fee based funding mechanism for municipal drainage management services. The user-fee is proportional to service demand similar to water, wastewater and solid waste services. The two major advantages over continued reliance on monies from the General Fund for drainage services are: 1) the establishment of a dedicated, long-term funding stream dedicated specifically for drainage management; and 2) customer user-fee equity. User-fees are assigned to property parcels based on storm-water runoff characteristics, not property value. The amount of impervious area such as rooftops, driveways, walkways and parking areas is used to assign Drainage Utility user-fees to all developed properties, both residential and commercial, within the City. The placement of impervious area on land increases both the flow

rate and volume of runoff; it is the single most significant land use characteristic in terms of demand placed on drainage infrastructure to convey storm-water runoff flows.

The Texas Local Government Code (Chapter 552.C) governs utility implementation and operation. Drainage Utility implementation requires a cost-of-service study to allocate drainage system operation and capital project costs to developed land parcels, incorporation of customer billing information into the City's utility billing system, and the adoption of two ordinances by the City Commission. The ordinances declare the City's drainage system to be a public utility, establish an enterprise fund to ensure that revenues are used only for drainage management purposes, detail how user-fees are assigned to properties, specify user-fee exemptions allowed by law, and specify the customer appeals process to address any concerns about user-fee assignment accuracy.

Drainage Utility Customer Billing Rate Structure Recommendations

Impervious Area: Impervious coverage (e.g. Building footprint, driveways/walkways and parking areas) on property parcels has been the preferred Drainage Utility user-fee assignment method for the majority of Texas drainage utilities and for drainage utilities throughout the United States. The rationale for impervious area based utility user-fee assignment is straight forward; replacing natural ground cover with impervious coverage results in more runoff volume and higher peak flow rates during storm events. Those impacts on the drainage infrastructure system translate into capital project, operating, and administrative costs borne by the drainage management program and funded by the utility service user-fee. For this study, impervious area was used to assign utility user-fees to property parcels.

The primary source of impervious coverage data for this study was Potter-Randall Appraisal District property data for building footprint and parking area; 79,460 property parcels were included in the evaluation. These data were supplemented with impervious area determinations from aerial ortho-photography. As specified by the Texas Local Government Code, no property value data were used in this study.

Equivalent Residential Unit: Equivalent residential billing unit (ERU) standards are widely used to assign utility user-fees. The ERU is defined as the average impervious area associated with single-family properties. For Amarillo, the average impervious area value for single-family houses is 2800 square feet. The use of the ERU allows simplification of the assignment of utility

user-fees to residential properties and it serves as the service unit measure to normalize assignment of user-fees to non-residential properties (e.g. commercial, industrial, institutional properties). This is the recommended billing unit standard to be applied to commercial, industrial, civic, religious organization and multi-family land uses.

Single-Family Residential Customer Class: Based on examination of the distribution of parcel-specific impervious area, a three-tiered rate structure was developed for single-family properties. Tiers are based on quartile evaluation. The central 50 percent of properties was used to define the impervious area value limits for the "Typical" property classification- 2,072 to 3,237 square feet. The lower 25 percent of properties are defined as the "Small" classification which applies to properties with less than 2,072 square feet impervious area. The highest 25 percent of properties was used to define the "Large" classification which applies to properties with greater than 3,237 square feet impervious area. The ERU assignment in each tier is defined by dividing the average impervious area per house in each tier by 2,800 square feet.

ERU Value: 2,800 square feet Impervious Area (IA)

Single-Family: Three Tiered

- Tier 1: "Small" 0.68 ERU, <2,072 square feet. IA
- Tier 2: "Typical" 1.0 ERU, 2,073-3,237 square feet. IA
- Tier 3: "Large" 1.51 ERU, >3,238 square feet IA

Non-Residential (Commercial/Industrial/Institutional/Governmental/Multi-Family) Customer Class: Non-residential properties are evaluated for billing unit assignment on a case-by-case basis due to their highly variable impervious area. The equivalent residential unit (ERU) value is used as the billing unit standard for user-fee assignment as follows:

Total ERUs/Land Parcel = (Parcel Impervious Area/2,800 sq. ft.)

As an example, one acre (43,560 square feet) of impervious area is equivalent to 15.6 ERUs.

Cost-of-Service Financial Analysis

A multi-year cost-of-service analysis has been conducted to evaluate drainage management service levels and associated customer monthly billing rates. The goals of this evaluation are to produce affordable customer billing rates while producing adequate revenue to support the

three major drainage management program components: 1) implementation of a basic, pro-active infrastructure operations and maintenance program, 2) design and construction of the four highest priority CIP projects, and accumulation of a reserve fund to address system repair/replacement needs and new land development infrastructure needs. The following is a summary of the proposed initial 5-year program:

Baseline Drainage Utility Budget

	Year 1	Year 2	Year 3	Year 4	Year 5
Operation and Maintenance	$ 1,931,821	$ 2,251,900	$ 2,655,804	$ 2,801,435	$ 2,984,405
Debt Service / Cash Capital	1,618,575	1,458,191	1,428,775	1,133,748	1,169,872
Transfers	102,626	104,678	106,772	108,907	111,085
Reserve Fund Contributions	889,326	727,578	350,998	498,257	276,985
Total Expenditures	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348

Estimated Drainage Utility User-fees

	Year 1	Year 2	Year 3	Year 4	Year 5
Residential (Per Dwelling)					
Tier 1-Small	$ 1.71	$ 1.71	$ 1.71	$ 1.71	$ 1.71
Tier 2-Typical	2.51	2.51	2.51	2.51	2.51
Tier 3-Large	3.79	3.79	3.79	3.79	3.79
Non-Residential (per ERU [(1)])	2.51	2.51	2.51	2.51	2.51

[(1)] ERU= 2,800 square feet impervious area

The baseline budget and user-fees presented above are estimated to support the following Drainage Utility program for the first five (5) years of operation:

- Transfer of nine existing personnel from the Street Department (General Fund) to the Drainage Utility and addition of 21 additional positions over the first five years of operation (see Attachment B for listing of personnel)
- Equipment purchase and related municipal garage costs
- $500,000 in Contractual Services support on an annual basis
- Additional budgeted costs of approximately $650,000 - $700,000 a year for other supplies, contractual services, and other miscellaneous charges
- Debt issue (20-year term, interest rate of 5.0%) of approximately $12 million in Year 1 to provide funds for four (4) capital projects
- Indirect cost support to the City's General Fund
- Maintenance of a 90-day Operations and Maintenance Reserve Fund

- Five-year build-up of a Capital Repair, Replacement, and New Development Reserve Fund of approximately $2 million
- Contributions to Employee Leave Payable Reserve Fund of 0.50% of total salaries and wages annually
- Debt Service Reserve Fund equivalent to one (1) times annual maximum outstanding debt service
- Maintenance of a 1.35x debt service coverage level (assumes all expenditures other than O&M are discretionary)

City Commission and CPIAC Coordination

A work session was conducted with the City Commission on November 15, 2011 to present findings and recommendations and to discuss implementation schedule. Prior to the Commission work session, four meetings were held with the Comprehensive Plan Implementation Advisory Committee (CPIAC) to present interim study findings and recommendations. At the conclusion of the final meeting on October 12, 2011, the Committee recommended implementation of a Drainage Utility.

Public Outreach

Four public meetings are scheduled for January 2012. There will be a second City Commission work session to discuss citizen input from the public meetings. If the City Commission elects to move forward with implementation, it is anticipated that the public hearings for the required ordinances will be conducted in March 2012. First billing is anticipated October 2012.

Task 1 Drainage Network Inventory

An inventory was made of drainage facilities in the City of Amarillo. GIS data provided by the City was analyzed and compiled into an inventory of existing constructed drainage infrastructure and natural waterway systems. The City's data was supplemented with data from the USGS National Hydrography Dataset. The inventory includes culverts (i.e., road crossings), storm drain conduits (i.e., conduits other than road crossings), inlets, manholes, junction boxes, pumps, headwalls, ditches/channels, and natural waterways. This inventory is the basis for establishing operations and maintenance service demand and infrastructure rehabilitation and replacement needs.

The drainage infrastructure component element data were summarized by length, material, and size depending on the type of facility. There are instances where a record exists for a particular drainage structure, but attribute data was not complete for size or material (e.g., the location and length of a pipe may be known but the pipe size is unknown). This was the case for approximately 5,520 linear feet of unknown size culvert, which represents 19% of the City's total quantity of culvert. This total includes a multiplier of 1.25 applied to the length of each culvert segment to account for the existence of culverts with multiple barrels. Approximately 83,528 linear feet of storm drain conduit were also found to have incomplete data, which represents 9% of the City's total quantity of storm drain conduit. For culverts, the total length of all unknown facilities was assigned a 36" RCP unit cost. For storm drains, the total length of all unknown facilities was assigned the average unit cost of all other similar facilities.

The unit costs for various component elements are from the 2011 City update of construction project cost estimates for the 1993 *Storm Water Management Master Plan.* Supplemental unit cost data was provided by City staff to cover all infrastructure types included in the inventory. In the case of all infrastructure elements typically within street ROW (culverts, storm drain conduits, manholes, junction boxes and inlets), a multiplier reflecting a 25% increase in unit cost has been added to account for demolition of existing pipe, pavement repair, nominal utility repairs, etc. In the case of infrastructure elements typically outside street ROW (pump stations and headwalls), no multiplier is added. The detailed infrastructure inventory is presented in **Appendix 1A** to this section. A roll-up quantity and cost summary for infrastructure elements is shown in the table below.

Table 1-1: Existing Infrastructure Summary Table

Item No.	Quantity	Unit	Item Description	Total Replacement Cost
1	29,448	LF	Culverts (Road Crossings)	$ 7,394,751
2	937,515	LF	Storm Drain Conduit	$ 111,496,292
3	3,302	EA	Inlets	$ 33,020,000
4	550	EA	Manholes	$ 4,125,000
5	255	EA	Junction Box	$ 2,390,625
6	6	EA	Playa Lake Pump Station	$ 679,000
7	176	EA	Headwall	$ 1,760,000
8	113,076	LF	Natural Stream	N/A
9	1,900	AC	Playa Lakes / Ponds	N/A
10	83,215	LF	Ditch / Channel	N/A
			Total Replacement Cost of Infrastructure	$ 160,865,669

The supplemented GIS data was used to produce a map of the City's drainage system; the map is presented in **Appendix 1B** to this section.

Appendix 1A

Infrastructure Inventory

City of Amarillo
Inventory-Replacement Cost of Drainage Infrastructure

Item No.	Quantity	Unit	Item Description	2011 Unit Price	Replacement Cost Factor	Replacement Cost Unit Price	Total Replacement Cost
Culverts (Road Crossings)							
1	282	LF	18" RCP Pipe	$ 55	1.25	$ 69	$ 19,390
2	191	LF	21" RCP Pipe	$ 55	1.25	$ 69	$ 13,114
3	1,333	LF	30" RCP Pipe	$ 60	1.25	$ 75	$ 99,965
4	1,850	LF	42" RCP Pipe	$ 100	1.25	$ 125	$ 231,231
5	2,074	LF	48" RCP Pipe	$ 140	1.25	$ 175	$ 363,004
6	87	LF	60" RCP Pipe	$ 160	1.25	$ 200	$ 17,331
7	391	LF	72" RCP Pipe	$ 220	1.25	$ 275	$ 107,518
8	761	LF	2X5 Box Culvert	$ 125	1.25	$ 156	$ 118,982
9	104	LF	3X2 Box Culvert	$ 130	1.25	$ 163	$ 16,847
10	1,116	LF	3X5 Box Culvert	$ 140	1.25	$ 175	$ 195,224
11	266	LF	3X6 Box Culvert	$ 145	1.25	$ 181	$ 48,282
12	211	LF	3X10 Box Culvert	$ 185	1.25	$ 231	$ 48,889
13	622	LF	4X2 Box Culvert	$ 190	1.25	$ 238	$ 147,722
14	1,050	LF	4X4 Box Culvert	$ 185	1.25	$ 231	$ 242,813
15	55	LF	4X6 Box Culvert	$ 250	1.25	$ 313	$ 17,272
16	1,497	LF	5X2 Box Culvert	$ 230	1.25	$ 288	$ 430,526
17	2,367	LF	5X3 Box Culvert	$ 210	1.25	$ 263	$ 621,381
18	874	LF	5X4 Box Culvert	$ 240	1.25	$ 300	$ 262,231
19	3,890	LF	6X3 Box Culvert	$ 355	1.25	$ 444	$ 1,726,188
20	332	LF	6X4 Box Culvert	$ 320	1.25	$ 400	$ 132,658
21	101	LF	6X9 Box Culvert	$ 340	1.25	$ 425	$ 42,802
22	4,262	LF	7X3 Box Culvert	$ 350	1.25	$ 438	$ 1,864,512
23	141	LF	8X8 Box Culvert	$ 535	1.25	$ 669	$ 94,167
23	71	LF	10X8 Box Culvert	$ 560	1.25	$ 700	$ 49,704
24	5,520	LF	Unknown Size RCP Pipe	$ 70	1.25	$ 88	$ 483,000
	29,448	**LF**	**Subtotal Culvert Replacement Cost**				**$ 7,394,751**
Pipeline material assumed to be RCP when not available. "Unknown" RCP pipe sizes assumed to have 36" RCP unit costs.							

City of Amarillo
Inventory-Replacement Cost of Drainage Infrastructure

Item No.	Quantity	Unit	Item Description	2011 Unit Price	Replacement Cost Factor	Replacement Cost Unit Price	Total Replacement Cost
Storm Drain Conduit							
25	196	LF	8" Vitrified Clay Pipe	$ 55	1.25	$ 69	$ 13,488
26	77	LF	18" Clay Tile	$ 55	1.25	$ 69	$ 5,262
27	7,894	LF	12" RCP Gravity	$ 55	1.25	$ 69	$ 542,682
28	448	LF	12" PVC Force Main	$ 40	1.25	$ 50	$ 22,387
29	4,968	LF	14" PVC Force Main	$ 45	1.25	$ 56	$ 279,440
30	17,451	LF	15" RCP Gravity	$ 55	1.25	$ 69	$ 1,199,756
31	31,891	LF	16" PVC Force Main	$ 60	1.25	$ 75	$ 2,391,810
32	73,511	LF	18" RCP Gravity	$ 55	1.25	$ 69	$ 5,053,854
33	3,077	LF	18" HDPE Gravity	$ 30	1.25	$ 38	$ 115,385
34	9,244	LF	21" RCP Gravity	$ 55	1.25	$ 69	$ 635,519
35	272	LF	24" CIP Gravity	$ 55	1.25	$ 69	$ 18,733
36	838	LF	24" CMP Gravity	$ 50	1.25	$ 63	$ 52,354
37	169,401	LF	24" RCP Gravity	$ 55	1.25	$ 69	$ 11,646,342
38	17,813	LF	24" HDPE Gravity	$ 31	1.25	$ 39	$ 690,268
39	8,502	LF	27" RCP Gravity	$ 55	1.25	$ 69	$ 584,542
40	102	LF	30" CMP Gravity	$ 65	1.25	$ 81	$ 8,258
41	11,481	LF	30" HDPE Gravity	$ 45	1.25	$ 56	$ 645,832
42	81,526	LF	30" RCP Gravity	$ 60	1.25	$ 75	$ 6,114,450
43	856	LF	33" HDPE Gravity	$ 55	1.25	$ 69	$ 58,825
44	522	LF	33" STM Gravity	$ 70	1.25	$ 88	$ 45,708
45	3,832	LF	33" RCP Gravity	$ 70	1.25	$ 88	$ 335,334
46	534	LF	36" CIP Gravity	$ 70	1.25	$ 88	$ 46,711
47	6,478	LF	36" HDPE Gravity	$ 65	1.25	$ 81	$ 526,321
48	94,568	LF	36" RCP Gravity	$ 70	1.25	$ 88	$ 8,274,716
49	5,588	LF	39" RCP Gravity	$ 85	1.25	$ 106	$ 593,756
50	405	LF	42" CIP Gravity	$ 100	1.25	$ 125	$ 50,683
51	64,456	LF	42" RCP Gravity	$ 100	1.25	$ 125	$ 8,056,972

City of Amarillo
Inventory-Replacement Cost of Drainage Infrastructure

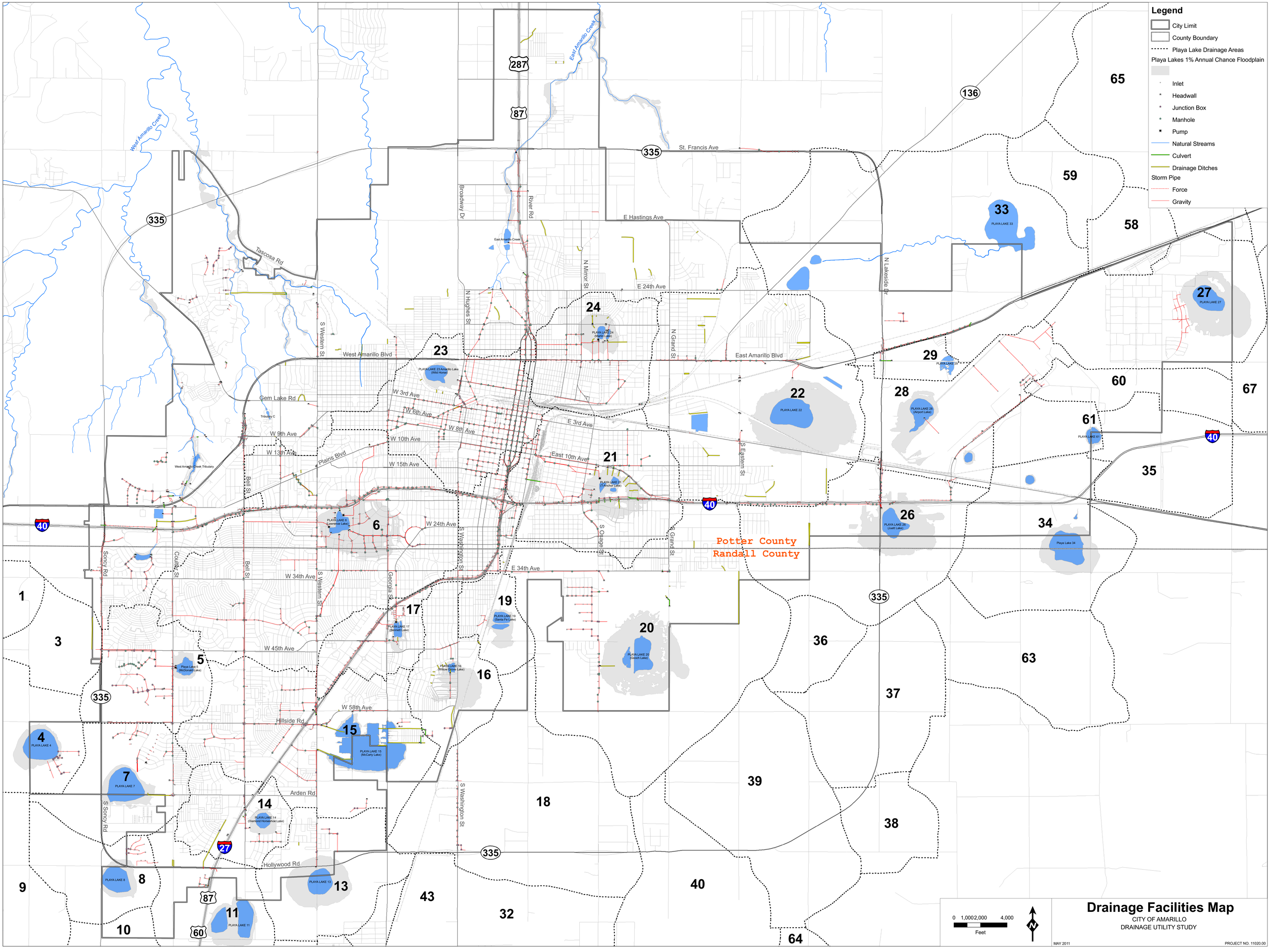
Item No.	Quantity	Unit	Item Description	2011 Unit Price	Replacement Cost Factor	Replacement Cost Unit Price	Total Replacement Cost
52	3,932	LF	42" HDPE Gravity	$ 75	1.25	$ 94	$ 368,656
53	337	LF	42" STM Gravity	$ 100	1.25	$ 125	$ 42,122
54	56	LF	45" RCP Gravity	$ 120	1.25	$ 150	$ 8,394
55	1,016	LF	48" CIP Gravity	$ 140	1.25	$ 175	$ 177,839
56	636	LF	48" CMP Gravity	$ 100	1.25	$ 125	$ 79,497
57	1,798	LF	48" HDPE Gravity	$ 85	1.25	$ 106	$ 191,061
58	62,684	LF	48" RCP Gravity	$ 140	1.25	$ 175	$ 10,969,628
59	625	LF	54" HDPE Gravity	$ 105	1.25	$ 131	$ 81,976
60	44,937	LF	54" RCP Gravity	$ 150	1.25	$ 188	$ 8,425,627
61	666	LF	60" HDPE Gravity	$ 130	1.25	$ 163	$ 108,217
62	30,484	LF	60" RCP Gravity	$ 160	1.25	$ 200	$ 6,096,765
63	351	LF	66" SRC Gravity	$ 190	1.25	$ 238	$ 83,290
64	24,769	LF	66" RCP Gravity	$ 190	1.25	$ 238	$ 5,882,554
65	31,728	LF	72" RCP Gravity	$ 220	1.25	$ 275	$ 8,725,215
66	5,193	LF	78" RCP Gravity	$ 255	1.25	$ 319	$ 1,655,202
67	11,757	LF	84" RCP Gravity	$ 315	1.25	$ 394	$ 4,629,215
68	8,652	LF	96" RCP Gravity	$ 365	1.25	$ 456	$ 3,947,485
69	8,251	LF	102" RCP Gravity	$ 445	1.25	$ 556	$ 4,589,342
70	186	LF	108" RCP Gravity	$ 500	1.25	$ 625	$ 116,079
71	83,528	LF	Unknown Size RCP Gravity	$ 70	1.25	$ 88	$ 7,308,741
	937,515	**LF**	**Subtotal Storm Drain Conduit Replacement Cost**				**$ 111,496,292**
Pipeline material assumed to be RCP when not available. "Unknown" pipe sizes assumed to have avg unit costs.							
Inlets							
72	3,302	EA	Inlet	$ 8,000	1.25	$ 10,000	$ 33,020,000
			Subtotal Inlet Replacement Cost				**$ 33,020,000**
Manholes							
73	550	EA	Manhole	$ 6,000	1.25	$ 7,500	$ 4,125,000
			Subtotal Manhole Replacement Cost				**$ 4,125,000**
Junction Box							
74	255	EA	Junction Box	$ 7,500	1.25	$ 9,375	$ 2,390,625
			Subtotal Junction Box Replacement Cost				**$ 2,390,625**

City of Amarillo
Inventory-Replacement Cost of Drainage Infrastructure

Item No.	Quantity	Unit	Item Description	2011 Unit Price	Replacement Cost Factor	Replacement Cost Unit Price	Total Replacement Cost
Pump							
75	1	EA	McDonald Playa Pump	$ 57,000	1.00	$ 57,000	$ 57,000
76	1	EA	Lawrence Playa Pump 6-2 West	$ 85,000	1.00	$ 85,000	$ 85,000
77	1	EA	Lawrence Playa Pump 6-3 NE	$ 85,000	1.00	$ 85,000	$ 85,000
78	1	EA	Bennett Playa Pump 17	$ 250,000	1.00	$ 250,000	$ 250,000
79	1	EA	T-Anchor Playa Pump 21	$ 92,000	1.00	$ 92,000	$ 92,000
80	1	EA	Martin Playa Pump 24	$ 110,000	1.00	$ 110,000	$ 110,000
			Subtotal Pump Replacement Cost				**$ 679,000**
Headwall							
81	176	EA	Headwall	$ 10,000	1.00	$ 10,000	$ 1,760,000
			Subtotal Headwall Replacement Cost				**$ 1,760,000**
			TOTAL REPLACEMENT COST OF INFRASTRUCTURE				**$ 160,865,669**
Open Waterway							
82	113,076	LF	Open Channel / Natural Stream	--------	--------	--------	--------
83	50,345	LF	Dirt Ditches	--------	--------	--------	--------
84	3,810	LF	Concrete / Dirt Ditches	--------	--------	--------	--------
85	10,630	LF	Stabilized Dirt Ditches	--------	--------	--------	--------
86	18,430	LF	Concrete Ditches	--------	--------	--------	--------
87	1,900	AC	Playa Lake	--------	--------	--------	--------

Appendix 1B

Drainage System Map


Legend
City Limit
County Boundary
Playa Lake Drainage Areas
Playa Lakes 1% Annual Chance Floodplain
Inlet
Headwall
Junction Box
Manhole
Pump
Natural Streams
Culvert
Drainage Ditches
Storm Pipe
Force
Gravity
West Amarillo Creek
East Amarillo Creek
287
87
335
136
40
27
60
St. Francis Ave
E Hastings Ave
E 24th Ave
E 3rd Ave
East 10th Ave
E 34th Ave
West Amarillo Blvd
East Amarillo Blvd
W 3rd Ave
W 6th Ave
W 8th Ave
W 9th Ave
W 10th Ave
W 13th Ave
W 15th Ave
W 24th Ave
W 34th Ave
W 45th Ave
W 58th Ave
Gem Lake Rd
Plains Blvd
Hillside Rd
Arden Rd
Hollywood Rd
Broadway Dr
River Rd
N Mirror St
N Hughes St
N Grand St
S Western St
S Washington St
S Osage Dr
S Eastern St
N Lakeside Dr
Bell St
Coulter St
Soncy Rd
S Soncy Rd
Tascosa Rd
Tributary C
West Amarillo Creek Tributary
PLAYA LAKE 22 Amarillo Lake (Wild Horse)
PLAYA LAKE 24 (Mayor Lake)
PLAYA LAKE 31 (Anchor Lake)
PLAYA LAKE 6 (Lawrence Lake)
PLAYA LAKE 17 (Bennett Lake)
PLAYA LAKE 19 (Santa Fe Lake)
PLAYA LAKE 20 (Odom Lake)
PLAYA LAKE 16 (Willow Grove Lake)
PLAYA LAKE 15 (McCarty Lake)
PLAYA LAKE 14 (Diamond Horseshoe Lake)
PLAYA LAKE 13
PLAYA LAKE 11
PLAYA LAKE 8
PLAYA LAKE 7
PLAYA LAKE 5 (McDonald Lake)
PLAYA LAKE 4
PLAYA LAKE 33
PLAYA LAKE 27
PLAYA LAKE 29
PLAYA LAKE 28 (Airport Lake)
PLAYA LAKE 22
PLAYA LAKE 61
PLAYA LAKE 26 (Juett Lake)
Playa Lake 34
Potter County
Randall County
1
3
4
5
6
7
8
9
10
11
13
14
15
16
17
18
19
20
21
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33
34
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36
37
38
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43
58
59
60
61
63
64
65
67
0 1,000 2,000 4,000
Feet
N
Drainage Facilities Map
CITY OF AMARILLO
DRAINAGE UTILITY STUDY
MAY 2011
PROJECT NO. 11020.00

Task 2 Drainage Maintenance Practices

The City of Amarillo currently operates and maintains drainage infrastructure under the umbrella of the Street Department. The Street Department is responsible for the repair of drainage facilities with assistance from the Utilities Division as required in certain circumstances. Repairs are conducted using a reactive approach—problems are addressed as they are discovered but there is no proactive approach to maintenance. The Street Department categorizes each repair work order in one of the 67 named categories. Of the 67 categories, 11 are drainage-related activities. However, most drainage system work orders, both in terms of number of work orders and level of effort, are historically categorized as "Code 499 – Miscellaneous".

Based on this assessment of the City's current operations and maintenance program as well as the infrastructure inventory described in Task 1 of this project, the following recommendations are made for program staff additions, equipment additions, and contractual services additions for operations, maintenance, and rehabilitation/replacement of the drainage network:

- Create an infrastructure operations and maintenance program within Public Works funded by the Drainage Utility;
- Four primary service areas are recommended as follows:
    - Open channel / Playa Maintenance; Cleaning / Dredging / Trash / Debris; Vegetation Control
    - Storm Drain Rehabilitation / Repair / Replacement
    - Storm Drain Cleaning
    - Street Sweeping (transfer from the Street Department)

2.1 Open Channel / Playa Maintenance Group

The open channel / playa maintenance group would be responsible for channels, playas, borrow ditches, roadway bridges / culverts, and erosion repair. This group would require a supervisor, an investigator to proactively identify and prioritize maintenance needs, and two crews (one foreman, three equipment operators, and four workers each) to perform required tasks. Based on 240 working days per year, performance criteria for this group include 15 miles of channel clearing per year per crew and/or 250 acres of playa cleared per year per crew. In order to meet this performance criteria, this group requires several pieces of equipment including hydroscopic excavators, loaders (tracked and wheeled), a tractor, a brush truck, 12-cubic-yard dump trucks, equipment trailers, and trucks.

2.2 Storm Drain Rehabilitation Group

The storm drain rehabilitation group would be responsible for repair and replacement of pipelines, manholes, junctions, inlets, headwalls, concrete work, and driveway culverts. The storm drain cleaning group would be responsible for pipelines, manholes, junctions, inlets, cattle guards, and video inspections. The storm drain rehabilitation and storm drain cleaning groups perform separate and distinct functions; however, they are placed under one supervisor.

The storm drain rehabilitation group includes two construction crews (one foreman, two operators, and four workers each) and two concrete crews (two concrete finishers each). Based on 240 working days per year per crew, performance criteria for the rehabilitation group include 2,000 linear feet of pipeline repair/replacement per year per crew. In order to meet these performance criteria, the rehabilitation group requires several pieces of equipment including a tracked excavator, backhoe loaders, 12-cubic-yard dump trucks, a boom truck, equipment trailers, trucks, etc. The recommended equipment set will support line placement up to 72 inches in diameter.

2.3 Storm Drain Cleaning Group

The storm drain cleaning group includes two storm drain cleaning crews (two workers each), two vacuum truck crews (one operator and one worker each), and one video crew (one operator and one worker each). Based on 240 working days per year per crew, performance criteria for this group is 2,500 inlets cleaned per year per crew, 30 miles of video per year per crew, and/or 25,000 feet of pipeline cleaned per year per crew. In order to meet these performance criteria, the cleaning group requires several pieces of equipment including a vacuum / jetter truck for each crew, a video truck, etc.

2.4 Street Sweeping Group

The street sweeping group would be responsible for trash and particulate pollutants collection. The personnel and equipment needed for this group will be transferred from the Streets Department including seven sweeper operators and one loader / roll-off container operator. Based on the fiscal year 2010 work order records, performance criteria for the street sweeping group includes 7,200 miles of street per year per sweeper.

2.5 Staff and Equipment Addition Plan

Staff and equipment additions must be phased over a multi-year period to mitigate fiscal impacts. Phasing additions is also appropriate from a logistics standpoint of staff training and efficiency (i.e., a video crew needs to evaluate a reasonable quantity of storm drain in order to identify and prioritize sections for rehabilitation / replacement).

Additions have been segmented into six phases, each representing different workgroups. These recommendations are presented tabular form in **Appendix 2A** to this section. This table includes equipment recommendations with make and model of specific manufacturers that meet desired specifications—it is understood that the City may elect other make/model machines that meet the desired specifications.

Completing the addition of phase A, B and C staff and equipment would provide a basic level of drainage infrastructure maintenance services in the open channel/Playa and storm drain service areas. With the transfer of eight (8) full-time equivalents (FTEs) from the Streets Department to create the street sweeping group, twenty-six (26) additional FTEs are required to create the open channel / playa maintenance group, the storm drain rehabilitation group, and the storm drain cleaning group as described above. The completion of phase D, E and F additions, twenty-one (21) additional staff and equipment, would support enhanced service levels by doubling field work performance capacity.

Basic Service Additions

- Phase A --- 7 FTEs plus equipment
    - One supervisor for the storm drain rehabilitation group and storm drain cleaning group (1 FTE)
    - One storm drain cleaning crew (2 FTEs)
    - One vacuum / jetter truck crew (2 FTEs)
    - One video crew (2 FTEs)
- Phase B --- 9 FTEs plus equipment
    - One storm drain construction crew (7 FTEs)
    - One concrete crew (2 FTEs)
- Phase C --- 10 FTEs plus equipment
    - One supervisor for the open channel / playa maintenance group (1 FTE)
    - One open channel / playa crew (8 FTEs)

- One investigator (1 FTE)

Enhanced Service Additions

- Phase D --- 4 FTEs plus equipment
  - One storm drain cleaning crew (2 FTEs)
  - One vacuum / jetter truck crew (2 FTEs)
- Phase E --- 9 FTEs plus equipment
  - One storm drain construction crew (7 FTEs)
  - One concrete crew (2 FTEs)
- Phase F --- 8 FTEs plus equipment
  - One open channel / playa crew (8 FTEs)

2.6 Field Engineering Support

In addition to the field operations staff, it is recommended that the City designate a new engineering position to provide support for field operations including drainage problem evaluation, small project design, utility coordination, and construction guidance.

2.7 Program Configuration by City for Initial 5-Years of Drainage Utility

Based on consideration of staff and equipment addition plan recommendations presented above and considering the Drainage Utility multi-year financial analysis conducted in Task 12-Financial Analysis of Drainage Utility System, the City specified the following staffing and equipment plan for the initial 5-years of the Drainage Utility. The plan includes the transfer of existing personnel and equipment from the Street Department and new staff and equipment additions. The development of this plan considered utility customer affordability (monthly billing rates) and the ability of the Drainage Utility revenue stream to support a basic pro-active drainage infrastructure operations and maintenance program, provide for design and construction of drainage management capital improvement projects, and to provide a reserve fund to support infrastructure repair/replacement and meet drainage infrastructure needs associated with new land development activity. The report section for Task 12 provides additional detail on the financial analysis.

2.8 Initial 5-Year Operations and Maintenance Staffing and Equipment Plan

This program has the capability for street sweeping to reduce trash and pollutants in the drainage system, regular storm drain inlet and pipe cleaning, television inspection to assess

storm drain pipe structural condition, storm drain inlet and pipe repair/replacement, and driveway culvert replacement, culvert and open channel cleaning and sediment removal.

	Year
Existing Personnel	
Sweeper Operator	2012
Sweeper Operator	2012
Sweeper Operator	2012
Sweeper Operator	2012
Operator (Hydroscopic Excavator)	2012
Equipment Operator I	2012
Concrete Foreman II	2012
Concrete Finisher	2012
Concrete Finisher	2012
Staff Additions	
Worker (Concrete Crew)	2012
Worker (Concrete Crew)	2012
Worker (Concrete Crew)	2012
Supervisor	2012
Sweeper Operator	2012
Foreman II - TV Crew	2012
Worker - TV Crew	2012
Operator - Vacuum/Jetter Truck Crew	2013
Worker - Vacuum/Jetter Truck Crew	2013
Worker - Storm drain Crew 1	2013
Worker - Storm drain Crew 1	2013
Roll-off Operator	2013
Operator - Const. Crew 1	2014
Worker - Const. Crew 1	2014
Dump Truck Driver - Const. Crew 1	2014
Foreman II - Const. Crew 1	2014
Worker - Const. Crew 1	2014
Dump Truck Driver - Const. Crew 1	2014
Boom Truck Driver - Const. Crew 1	2015
Backhoe Operator - Concrete Excavation Crew 1	2016
Worker- Concrete Excavation Crew 1	2016

Existing Equipment	
Hydroscopic Excavator Gradall XL4100	2012
Dump Truck, 12 yd, 50,000GVW	2012
Sweeper	2012
Sweeper	2012
Sweeper	2012
Sweeper	2012
Sweeper	2012
2 1/2 Ton Truck	2012
1 Ton Truck	2012
1/2 Ton Truck	2012
Equipment Additions	
1 Ton Truck	2012
1/2 Ton Truck	2012
Sweeper	2012
TV Truck, Complete System, Aries	2012
Subtotal	
Vac/Jetter Truck, Vactor 2100	2013
1 Ton Truck	2013
Roll-off Container / Tractor - Trailer	2013
Loader / Dump Truck 34,500 GW	2013
Subtotal	
2 1/2 Ton Truck	2014
Backhoe Loader, Wheeled, Deere 410J	2014
Equipment Trailer	2014
Air Compressor	2014
Dump Truck, 12 yd, 50,000GVW	2014
1/2 Ton Truck	2014
2 1/2 Ton Truck	2014
Equipment Trailer	2014
Hydraulic Breaker	2014
Vibratory Plate Compactor	2014
Jumping Jack Compactor	2014
Arrow Board	2014
Dump Truck, 12 yd, 50,000GVW	2014
Subtotal	
Boom Truck	2015
Walk Behind Pavement Saw	2015

Vibratory Trench Roller	2015
Subtotal	
2 1/2 Ton Truck	2016
Backhoe Loader, Wheeled, Deere 410J	2016
Equipment Trailer	2016
Air Compressor	2016

Appendix 2A

Amarillo Drainage Maintenance Program
Staff and Equipment Recommendations Plan

Amarillo Drainage Infrastructure Maintenance Program

Incorporated Area-101 sq mi
Population 190,000

Open Channel/Playa Maintenance Cleaning/Dredging/Trash/Debris/Vegetation	Stormdrain Rehab/Repair/Replace	Stormdrain Cleaning	Street Sweeping
Services			
Channels **Playas** **Borrow Ditches** **Roadway Bridges/Culverts** **Erosion Repair**	**Pipelines/Manholes/Junctions** **Inlets** **Headwalls** **Concrete Work** **Driveway Culverts**	**Pipelines/Manholes/Junctions** **Inlets** **Cattle Guards** **TV Inspection**	**Trash and Particulate Pollutants Collection**
Personnel			
Supervisor (1)-C Open Channel/Playa Crew (2)-C/F 1 Fore, 3 Op, 4 Wkr Investigator (1)-C 1 Wkr	Supervisor (1)-A Construction Crew (2)-B/E 1 Fore, 2 Op, 4 Wkr Concrete Crew (2)-B/E 2 Con Fin	Stormdrain Crew (2)-A/D 2 Wkr Vacuum/Jetter Truck Crew (2)-A/D 1 Op, 1 Wkr TV Crew (1)-A 1 Op, 1 Wkr	Personnel & Equipment transfer from Streets Dept-A Sweeper Operators (7) 1 Op Loader/Roll-Off Container (1) 1 Op
Number of service elements noted in brackets (#), Letter indicates staff and equipment sequencing priority (Basic-Blue, Enhanced-Green)			
Performance			
15 miles channel clear/year/crew 250 acres Playa cleared/year/crew Flood Event Response	2000 feet pipeline repair-replace/year/crew Flood Event Response	2500 inlets cleaned/year/crew 30 miles TV/year/crew 25,000 feet pipeline cleaned/year/crew Flood Event Response	7,200 miles/year/sweeper
Equipment			
Hydroscopic Excavator, Gradall XL4100 (1 unit, 1 unit) Loader, Tracked, Deere CT315 (1 unit) Loader, Tracked, Deere 605C (1 unit, 1 unit) Loader, Wheeled, Deere 304J (1 unit) Loader, Wheeled, Deere 544K (1 unit) Tractor, Deere 4105 w/ rotary mower (1 unit, 1 unit) Brush Truck, Effer 130.11LSV (1 unit) Dump Truck, 12 yd, 50,000GVW (3 units, 3 units) Equipment Trailers (as required) Truck, 1-ton to 2.5-ton (2 units, 2 units)	Excavator, Tracked, Deere 250G LC (1 unit, 1 unit) Hydraulic Breaker for Excavator (1 unit, 1 unit) Tractor-Trailer for Tracked Excavator (1 unit) Backhoe Loader, Wheeled, Deere 410J (2 unt, 2 unt) Dump Truck, 12 yd, 50,000GVW (1 unit, 1 unit) Boom Truck, Terex BT 3870 (1 unit) Arrow Board (1 unit, 1 unit) Equipment Trailers (as required) Vibratory Plate Compactor (1 unit, 1 unit) Air Compressor w/ trailer (1 unit) Walk Behind Trencher (1 unit) Walk Behind Pavement Saw (1 unit) Vibratory Trench Roller, 22" (1 unit) Truck, 1-ton to 2.5-ton (2 units, 2 units)	Vacuum/Jetter Truck, Vactor 2100 (1 unit, 1 unit) TV Truck, Complete System, Aries (1 unit) Truck, 1/2-ton (1 unit, 1 unit)	Sweeper (8 units) Loader/Dump Truck, 34,500GVW (1 unit) Roll-Off Container/Tractor-Trailer (1 unit)

Task 3 Review of Storm Water Management Master Plan

3.1 Background

The City completed a Storm Water Management Master Plan in 1993. The Master Plan included project identification, preliminary engineering and construction cost estimation for flood hazard mitigation improvements throughout the City. The projects generally fall into three categories: roadway storm drain systems, playa lake improvements (pump systems, force mains and additional volume excavation) and open channel improvements. A total of 44 projects were included in the master plan evaluation. Since the completion of the master plan, four (4) projects have been constructed. Since the completion of the master plan, the City has identified additional project needs for 16 areas and completed preliminary engineering and cost evaluation. Street storm drain systems were evaluated for conveyance of 2-year storm flows within curb-to-curb limits.

3.2 Master Plan Costs Update

Since over 17 years have elapsed since the master plan was completed, project costs were updated by the City to reflect current, year 2011, construction costs. Additionally, as costs were being updated, the City made adjustments to project quantity detail where a portion of a project has been constructed and to make engineering adjustments to improve project performance. Table 3-1 presents the 1993 and updated construction costs and total costs estimates for each project; the projects are listed in implementation priority order. To estimate total project costs (engineering design, construction and project management), a contingency factor of 20-30 percent was applied to the updated project construction cost estimates.

The project cost increase from 1993 is 30 percent. Over this time period, the Engineering News Record (ENR) construction cost index increased 75 percent. The ENR standard is a national average and does not reflect Amarillo area specific economic conditions. Since the current unit cost information used by the City for project cost estimation is representative of recent infrastructure construction activity in the Amarillo area, it is more accurate than use of the ENR construction cost index for cost adjustment. Additionally, there is very limited information in the master plan to support quantitative project prioritization; therefore, the priorities established by the City in combination with citizen reports of flooding frequency and severity provide the best reference for ranking projects for implementation.

3.3 Projects Identified Post Master Plan

Since the completion of the master plan in 1993, the City has identified 16 additional flood hazard mitigation projects. The City has completed preliminary engineering and developed cost estimates for these projects. Table 3-2 presents construction costs and total costs estimates for each of these projects; the projects are listed in implementation priority order.

3.4 Project Location

Appendices 3A, 3B, 3C, and 3D to this section are maps of the City indicating general project infrastructure layout and coding to indicate project status for the projects listed in Tables 3-1 and 3-2.

3.5 Total CIP Costs

Total current project costs for the 56 projects are estimated at $66,137,350. Any reference to project cost at a future date should take inflation into account. The ENR construction cost index increased at an annual rate of 3.25 percent over the period year 2000 to year 2010.

If the City elects to design the storm drain systems to a 5-year or 10-year street flow capacity standard as recommended in the review of the City's drainage criteria (Task 4), project costs will increase for storm drain infrastructure projects (inlets, laterals, pipelines, junction boxes, manholes, and headwalls). A column in Tables 3-1 and 3-2 identifies storm drain infrastructure projects for cost adjustment if higher service level is desired. The cost increase factors developed in Task 4 are 25 percent increase for 5-year street flow capacity design standard and 40 percent increase for 10-year design standard.

Table 3-1: Master Plan Stormwater Capital Improvement Projects

PROJECT	DESCRIPTION	PRIORITY ORDER	HDR ESTIMATED COST 04/01/1993	REVISED ESTIMATED COST 4/20/11 LESS CONT.	REVISED ESTIMATED COST 4/20/11 INCLUDING CONT.	STORMDRAIN PROJECTS
	GROUP I					
P15-CA	Catalpa/Farmers/Western	1	$3,145,566	$5,600,000	$6,720,000	X
P15-HH	Hillside/Hampton/SW 51st/Western	2	$1,480,375	$1,790,000	$2,148,000	X
P6-FW	Fleetwood/Terrace/Teckla/Fulton	3	$1,195,009	$1,540,000	$1,848,000	X
CE-M1	Amarillo Creek: Willow Creek to Hastings	4	$477,975	$900,000	$1,170,000	
CE-M2	Amarillo Creek: Hastings to River Road	4	$527,000	$1,280,000	$1,664,000	
P6	Lawrence Lake	5	$1,182,500	$1,700,000	$2,040,000	
P16	Willow Grove Lake	6	$416,500	$500,000	$600,000	
	GROUP I TOTAL		$8,424,925	$13,310,000	$16,190,000	
	GROUP II					
P6-TS	SW 26th: Georgia Area	7	$1,993,396	$1,000,000	$1,250,000	X
P17	Bennett lake	8	$4,027,000	$7,800,000	$9,750,000	
P24	Martin Lake	9	$2,634,000	$3,000,000	$3,750,000	
P5-CO	Coulter: SW 45th to Hillside	10	$41,300	$900,000	$1,125,000	X
P21	T-Anchor Lake	11	$876,000	$1,250,000	$1,562,500	
CE-T3	River Rd/Park/Hastings/ Angelus	12	$237,888	$390,000	$487,500	
CE-T1	Echo Tributary: Willow Creek to Hastings	13	$104,050	$140,000	$175,000	
CW-MP	Medi-Park: SW 9th to Coulter	14	$677,600	$530,000	$662,500	
CW-AC	West Hills: Amarillo Blvd to Gem Lake	15	$138,850	$220,000	$275,000	
	GROUP II TOTAL		$10,730,084	$15,230,000	$19,037,500	
	GROUP III					
P16-RH	Everest: Trinchera to Outfall	16	$416,390	$490,000	$637,000	X
CE-BO	Mesa Verde: N Bolton to NE 32nd	17	$195,220	$280,000	$364,000	X
P6-DD	Dilday Draw: Western to Plains	18	$662,076	$360,000	$468,000	X
CE-T2	St. Francis/Valley/Sherrill	19	$29,100	$55,000	$71,500	
CW-SJ	N Mississippi: NW 2nd to NW 11th	20	$326,670	$400,000	$520,000	
P23	Wild Horse Lake	21	$71,750	$100,000	$130,000	
CE-T4	Colorado/Buck/Studebaker/Hastings	22	$111,340	$180,000	$234,000	
P22-UT	Fritch/Eastern/NE 13th/Amarillo Blvd	23	$180,175	$129,000	$167,700	
P6-JN	Julian: I-40 to SW 15th	24	$244,090	$420,000	$546,000	X
P23-OL	Divert Ong/Lipscomb to Wild Horse	25	$1,613,810	$1,870,000	$2,431,000	X
P15	McCarty Lake	26	$4,601,500	$5,160,000	$6,708,000	
CW-TC	Tascosa Country Club	27	$11,925	$30,000	$39,000	
P20-R3	SE 27th/RR Underpass	28	$13,530	$60,000	$78,000	X
P26	Juett Lake	29	$50,000	$90,000	$117,000	
CW-WC	SW 9th to Range Riders	30	$15,100	$30,000	$39,000	
P7	Lake at Soncy and Arden	31	$650,000	$500,000	$650,000	
P18	Lake at Burlington and Hollywood	32	$498,000	$590,000	$767,000	
P35	Lake at East I-40 and Jackrabbit	33	$50,000	$60,000	$78,000	
P34	Lake at East I-40 and Pullman	34	$110,000	$150,000	$195,000	
P20-I4	SE 19th/I-40: Osage to Marrs	35	$1,266,875	$1,990,000	$2,587,000	X
P6-OE	Olsen: Western to Emil	36	$1,103,675	$1,360,000	$1,768,000	X
CW-WA	Amarillo Blvd West/Wolflin/ CRI&P RR	37	$420,000	$1,390,000	$1,807,000	
P14	Diamond Horseshoe Lake	38	$162,000	$200,000	$260,000	
CE-R1	SE 3rd/RR Underpass	39	$129,700	$280,000	$364,000	X
P21-R2	SE 10th/RR Underpass	40	$90,000	$225,000	$292,500	X
	GROUP III TOTAL		$13,022,926	$16,399,000	$21,318,700	
	TOTAL OF ALL GROUPS		**$32,177,935**	**$44,939,000**	**$56,546,200**	
	COMPLETED PROJECTS					
CW-WM	Westgate Mall/Puckett West		$645,620	$0	*0.00	
P15-FE	SW 58th: Royce to Georgia		$154,080	$0	*0.00	
P5	McDonald Lake		$1,938,000	$0	*0.00	
CE-M3	E Amarillo Creek: NW 24th to NW 13th		$132,500	$0	*0.00	
	TOTAL COMPLETED PROJECTS		**$2,870,200**	**$0**	**$0**	

Table 3-2: Post Master Plan Stormwater Capital Improvement Projects

	PROJECT	DESCRIPTION	PRIORITY ORDER	REVISED ESTIMATED COST 4/20/11	REVISED ESTIMATED COST 4/20/11 INCLUDING CONT.	STORMDRAIN PROJECTS
		GROUP I				
P6-OL	410226	Olsen Storm Sewer Ext /S Western St to Lawrence Lake	1	$420,000	$504,000	X
P20-GC	410233	SE 34th Ave /S Grand St intersection Drainage Channel	2	$300,000	$360,000	X
P6-H2	410237	Hillside Rd/Hampton Storm Sewer	3	$3,600,000	$4,320,000	X
P7-CO	410247	S Coulter St & Loop 335 Storm Sewer	4	$1,200,000	$1,440,000	X
CW-MP2	ENG-9903	Hagey Blvd Headwall and Channel	5	$60,000	$72,000	
		GROUP I TOTAL		$5,580,000	$6,696,000	
		GROUP II				
CW-	410369	Partridge Dr/Cloud Crest Dr Intersection and John David Drive and Club Meadow Dr from Plum Creek	6	$225,000	$281,250	X
	410373	Westwood Suncrest Drainage Channel	7	$275,000	$343,750	X
	410378	Quail Creek Unit 23 Drainage Channel	8	$70,000	$87,500	X
	410422	Wolflin to Amarillo Blvd West Storm Sewer	9	$900,000	$1,125,000	X
	410532	SW 9th Avenue to N of Tealwood Drainage Channel	10	$60,000	$75,000	X
	410534	Cloister Storm Sewer	11	$225,000	$281,250	X
	410536	Lowes/WalMart Storm Sewer	12	$500,000	$625,000	X
		GROUP II TOTAL		$2,255,000	$2,818,750	
		GROUP III				
	410169	Comanche Drainage Channel	13	$125,000	$162,500	X
	410170	Culvert replacement at Various Locations	14	$750,000	$975,000	
P23-E1	410175	Wildhorse Lake Improvement	15	$105,000	$136,500	
	410253	Headwall Improvements various locations	16	$100,000	$130,000	
		GROUP III TOTAL		$1,080,000	$1,404,000	
		TOTAL		**$8,915,000**	**$10,918,750**	

Appendix 3A

Drainage Improvement Projects – Northeast Quadrant

Proposed Storm Management Improvements NE Quadrant

Legend

City of Amarillo Storm Drainage Projects

1993 Study

Channel Work
- Channels
- Culverts

Playa Work
- Playa Work
- Playa Lines

Storm Sewer Work
- Storm Sewer Lines

Completed Work
- Completed Work

City Study

Channel Work
- Additional Channels

Storm Sewer Work
- Additional Storm Sewer Lines

Playa
- Drainage Boundary with Water Edge

Drainage Areas
- Channel, Creek, and Floodway Boundaries

City
- City Street Centerline
- Railway
- City Limits

Existing Storm Sewer
- Gravity Main Lines
- Force Main Lines

P1-xx - Project No.
See attached sheets for description of Projects. Use Project No. to locate identified projects.

CITY OF AMARILLO TEXAS
ENGINEERING DEPARTMENT

Quadrant Proposed Projects

Playa Projects

Project No	Name	Estimated Cost
P21	T-Anchor Lake (Playa 21)	$1,562,500
P24	Martin Lake (Playa 24)	$3,750,000
P26	Juett Lake (Playa 26)	$117,000
P34	Playa 34	$195,000

Storm Sewer Projects

Project No	Name	Estimated Cost
CE-BO	E Amarillo Creek: N Bolton at Mesa Verde	$364,000
CE-R1	E Amarillo Creek: 2nd Ave, RR Underpass	$364,000
P20-R3	Gooch Lake: 27th Ave Underpass	$78,000
P21-I4	T-Anchor Lake: I-40, 27th Ave / Outfall	$2,587,000
P21-R2	T-Anchor Lake:10th Ave/RR Underpass	$292,500

Channel Projects

Project No	Name	Estimated Cost
CE-M1	E Amarillo Creek: Yucca / Irwin	$1,170,000
CE-T1	E Amarillo Creek: Echo St Tributary	$175,000
CE-T2	E Amarillo Creek: St Francis Ave Tributary, Valley	$71,500
CE-T3	E Amarillo Creek: Valley Park Tributary, River Rd	$487,500
CE-T4	E Amarillo Creek: Ross Rogers, Colorado	$234,000
P22-UT	Playa 22 Unnamed Tributary Channel	$167,700

City Channel Projects

Project No	Name	Estimated Cost
CULV	Culverts: Various Loc	$975,000

Completed Projects (Whole or Part)

Project No	Name	Estimated Cost
CE-M1*	E Amarillo Creek: Willow Creek & Pavillard Culverts	
P22-UT*	Playa 22 Unnamed Tributary Channel	

Appendix 3B

Drainage Improvement Projects – Northwest Quadrant

Proposed Storm Management Improvements NW Quadrant

Legend

City of Amarillo Storm Drainage Projects

1993 Study

Channel Work
- Channels
- Culverts

Playa Work
- Playa Work
- Playa Lines

Storm Sewer Work
- Storm Sewer Lines

Completed Work
- Completed Work

City Study

Channel Work
- Additional Channels

Storm Sewer Work
- Additional Storm Sewer Lines

Playa
- Drainage Boundary with Water Edge

Drainage Areas
- Channel, Creek, and Floodway Boundaries

City
- City Street Centerline
- Railway
- City Limits

Existing Storm Sewer
- Gravity Main Lines
- Force Main Lines

P1-xx - Project No.
See attached sheets for description of Projects. Use Project No. to locate identified projects.

Quadrant Proposed Projects

Playa Projects

Project No	Name	Estimated Cost
P6	Lawrence Lake (Playa 6)	$2,040,000
P21	T-Anchor Lake (Playa 21)	$1,562,500
P23	Wild Horse Lake (Playa 23)	$130,000

Storm Sewer Projects

Project No	Name	Estimated Cost
CE-R1	E Amarillo Creek: 2nd Ave, RR Underpass	$364,000
P6-DD	Lawrence Lake: Dilday Draw, Western/outfall	$468,000
P6-JN	Lawrence Lake: Julian, 15th/Outfall	$546,000
P6-OE	Lawrence Lake: Olsen/Emil-Outfall	$1,768,000
P6-TS	Lawrence Lake: 26th-Hawthorne/Austin	$1,250,000
P20-R3	Gooch Lake:27th Ave Underpass	$78,000
P21-R2	T-Anchor Lake:10th Ave/RR Underpass	$292,500
P23-OL	Wild Horse Lake: Ong,15th to Outfall	$2,431,000

Channel Projects

Project No	Name	Estimated Cost
CE-M2	E Amarillo Creek: River Rd to Cliffside, culverts	$1,843,200
CE-T2	E Amarillo Creek: St Francis Ave Tributary, Valley	$76,700
CE-T3	E Amarillo Creek: Valley Park Tributary, River Rd	$487,500
CE-T4	E Amarillo Creek: Ross Rogers, Colorado	$234,000
CW-AC	W Amarillo Creek:Country Club, W 3rd, Gem Lake	$275,000
CW-MP	W Amarillo Creek:Medipark, Wallace	$662,500
CW-SJ	W Amarillo Creek: San Jacinto Hts	$520,000
CW-TC	W Amarillo Creek:Tascosa Country Club,Trevino	$39,000
CW-WA	W Amarillo Creek: Ama Blvd/RTT	$1,807,000
CW-WC	W Amarillo Creek: Westcliff, Lowe's	$39,000

City Channel Projects

Project No	Name	Estimated Cost
CCW-RT	W Amarillo Creek: AISD/B I-40/MediPark	$1,125,000
CP23-E1	Wildhorse Lake Improvement	$136,500
CULV	Culverts: Various Loc	$975,000

City Storm Sewer Projects

Project No	Name	Estimated Cost
CCW-M3	W Amarillo Creek: Partridge/Cloud Crest	$281,250
CCW-QC	Quail Creek Channel from Plum Creek	$87,500
CCW-TW	W Amarillo Creek: 9th to Tealwood, Sunny/Avondale	$75,000
CCW-WC	W Amarillo Creek: Tascosa/ Westwood	$343,750

Completed Projects (Whole or Part)

Project No	Name
P6-TS*	26th Ave Storm Sewer
CW-MP*	MediPark Channel & Culvert
CE-M3*	NW 24th Ave Storm Sewer

CITY OF AMARILLO TEXAS
ENGINEERING DEPARTMENT

N W E S

W WILLOW CREEK DR · E WILLOW CREEK DR · N SONCY RD · FM 1719 · FM 2176 · CLIFFSIDE RD · SAINT FRANCIS AVE · CE-M2 · CE-M2* · DUMAS DR · RIVER RD · BROADWAY DR · W CENTRAL AVE · E CENTRAL AVE · CE-T4 · CE-T3 · CE-T2 · CE-R1 · LOOP 335 NORTH · RM 1061 / BOYS RANCH RD · W HASTINGS AVE · E HASTINGS AVE · SMELTER RD · East Amarillo Creek · CULV · UNNAMED BASIN · CE-M3* · NW 24TH AVE · NE 24TH AVE · NE 15TH AVE · N HUGHES ST · DUMAS DR · NW 15TH AVE · FAIRWAY DR · CW-TC · N COULTER ST · N WESTERN ST · CW-SJ* · CW-SJ · CW-AC · (EXIT RAMP) · N MCMASTERS ST · E AMARILLO BLVD · P23 · PLAYA LAKE 23 Amarillo Lake (Wild Horse) · CP23-E1 · NW 3RD AVE · NE 3RD AVE · P23-OL · SW 3RD AVE · GEM LAKE RD · S WESTERN ST · S MCMASTERS ST · SW 6TH AVE · SE 6TH AVE · SW 8TH AVE · SE 8TH AVE · CULV · LINE AVE · SW 10TH AVE · SE 10TH AVE · P21 · P21-R2 · P6 · P6-JN · P6-DD · SW 15TH AVE · SE 15TH AVE · S GEORGIA ST · CROCKETT ST · S HARRISON ST · S TYLER ST · S ARTHUR ST · IH 40 · WOLFLIN AVE · CANYON DR (RM 27) · S WASHINGTON ST · SW 24TH AVE · SE 24TH AVE · P6-TS · P6-TS* · P6-OE · PARAMOUNT BLVD · 3625 · 3628 3999 · PLAYA LAKE 6 (Lawrence Lake) · CCW-WC · CCW-M3 · CCW-QC · CCW-TW · Tributary C · BUSHLAND BLVD · BELL ST · CW-MP* · West Amarillo Creek Tributary · CW-MP · WALLACE BLVD · HAGY BLVD · CW-WA · CCW-RT · W AMARILLO BLVD · AMARILLO BLVD · Unnamed Basin · S COULTER ST · S AVONDALE ST · PLAINS BLVD · DIXIE ST · SW 9TH AVE · SW CR 9 · LOOP 335 WEST · HELIUM RD · TASCOSA RD · INDIAN HILL RD · HOPE RD · W IH 40 · IH 40 EXIT 62A · (EXIT RAMP) · IH 40 · SONCY · OLSEN BLVD · BELL ST

Appendix 3C

Drainage Improvement Projects – Southeast Quadrant

Proposed Storm Management Improvements SE Quadrant

Quadrant Proposed Projects

Playa Projects

Project No	Name	Estimated Cost
P18	Playa 18	$767,000
P21	T-Anchor Lake (Playa 21)	$1,562,500
P26	Juett Lake (Playa 26)	$117,000
P34	Playa 34	$195,000

Storm Sewer Projects

Project No	Name	Estimated Cost
P20-R3	Gooch Lake: 27th Ave Underpass	$78,000
P21-I4	T-Anchor Lake: I-40, 27th Ave / Outfall	$2,587,000
P21-R2	T-Anchor:10th Ave/RR Underpass	$292,500

City Channel Projects

Project No	Name	Estimated Cost
CP20-GC	SE 34th / Grand at Comanch Golf Course	$360,000
CP20-G3	Comanche: Gun Club	$162,500

CITY OF AMARILLO TEXAS
ENGINEERING DEPARTMENT

Legend

City of Amarillo Storm Drainage Projects

1993 Study

Channel Work
- Channels
- Culverts

Playa Work
- Playa Work
- Playa Lines

Storm Sewer Work
- Storm Sewer Lines

Completed Work
- Completed Work

City Study

Channel Work
- Additional Channels

Storm Sewer Work
- Additional Storm Sewer Lines

Playa
- Drainage Boundary with Water Edge

Drainage Areas
- Channel, Creek, and Floodway Boundaries

City
- City Street Centerline
- Railway
- City Limits

Existing Storm Sewer
- Gravity Main Lines
- Force Main Lines

P1-xx - Project No.
See attached sheets for description of Projects. Use Project No. to locate identified projects.

PLAYA LAKE 21(T-Anchor Lake) P21
P21-I4
P21-I4
P21-I4
P21-I4
ROSS ST
QUARTER HORSE DR
TEE ANCHOR BLVD
S HARRISON ST
CANYON DR (IH 27)
SE 24TH AVE
SE 26TH AVE
P20-R3
S ARTHUR ST
ROSS CHASE DR
SE 27TH AVE
S NELSON ST
SE 29TH AVE
S BOLTON ST
S EASTERN ST
S TYLER ST
SE 34TH AVE
CP20-GC
Playa Lake 19 (Santa Fe Lake)
CP20-G2
SE 46TH AVE
S GRAND ST
Playa Lake 20 (Gooch Lake)
TRADEWIND ST
SE 58TH AVE
NW 15TH AVE
S WHITTAKER RD
IH 40
E IH 40
S LAKESIDE DR
P26
PLAYA LAKE 26 (Juett Lake)
Playa Lake 36
LOOP 335 EAST
Playa Lake 37
AIRPORT BLVD
UNNAMED BASIN
SE 3RD AVE
UH 287
S PULLMAN RD
S PARSLEY RD
PLAYA LAKE 34
Playa Lake 34
P34
SE CR 34
JUETT-ATTEBURY RD
SE CR 46
Playa Lake 63
SE 58TH AVE
Playa Lake 68
W FARMERS AVE
E FARMERS AVE
P18
Playa Lake 18
Playa Lake 38
Playa Lake 39
E HOLLYWOOD RD
LOOP 335 SOUTH
S OSAGE ST
W SUNDOWN LN
E SUNDOWN LN
Playa Lake 40
Playa Lake 32
E FM 1151
FM 1258

Appendix 3D

Drainage Improvement Projects – Southwest Quadrant

Proposed Storm Management Improvements SW Quadrant

Legend

City of Amarillo Storm Drainage Projects

1993 Study

Channel Work
- Channels
- Culverts

Playa Work
- Playa Work
- Playa Lines

Storm Sewer Work
- Storm Sewer Lines

Completed Work
- Completed Work

P1-xx - Project No.
See attached sheets for description of Projects. Use Project No. to locate identified projects.

City Study

Channel Work
- Additional Channels

Storm Sewer Work
- Additional Storm Sewer Lines

Playa
- Drainage Boundary with Water Edge

Drainage Areas
- Channel, Creek, and Floodway Boundaries

City
- City Street Centerline
- Railway
- City Limits

Existing Storm Sewer
- Gravity Main Lines
- Force Main Lines

Quadrant Proposed Projects

Playa Projects

Project No	Name	Estimated Cost
P7	Playa 7	$650,000
P14	Diamond Horseshoe Lake (Playa 14)	$260,000
P15	McCarty Lake (Playa 15)	$6,708,000
P16	Willow Grove Lake (Playa 16)	$600,000
P17	Bennett Lake (Playa 17)	$9,750,000
P18	Playa 18	$767,000

Storm Sewer Projects

Project No	Name	Estimated Cost
P5-CO	McDonald Lake: Van Winkle / Coulter	$1,125,000
P6-FW	Lawrence Lake: Western, 45th / Cougar	$1,848,000
P6-OE	Lawrence Lake: Olsen / Emil-Outfall	$1,768,000
P6-TS	Lawrence Lake: 26th-Hawthorne / Austin	$1,250,000
P15-CA	Catalpa Lane: I-40 to Green Haven	$6,720,000
P15-HH	McCarty Lake: 34th / Coulter - Bell / 48th	$2,148,000
P16-RH	Willow Grove: Everest from Trinchera to Outfall	$637,000

City Channel Projects

Project No	Name	Estimated Cost
CP4-HE	Playa 4: Outfall	$1,625,000
CP5-SH	McDonald Lake: Wesley, Tripp / Van Winkle	$281,250
CP5-WM	McDonald Lake: WalMart / Lowes Channel	$625,000
CP6-OF	Lawrence: Outfall	$504,000
CP7-CO	Playa 7: Coulter / Loop 335	$1,440,000
CP15-H2	McCarty Lake: Fulton / Hampton Connections	$2,100,000
CULV	Culverts: Various Loc	$975,000

Completed Projects (Whole or Part)

Project No	Name
CW-WM*	W Amarillo Creek: West Gate Mall Storm Sewer System
P5*	McDonald Lake Excavation, Pump & Force Mail
P6-TS*	26th Ave Storm Sewer
P15-RE*	McCarty Lake: Georgia Storm Sewer & Outfalls
P17*	Bennett Lake Excavation

CITY OF AMARILLO TEXAS
ENGINEERING DEPARTMENT

N W E S

IH 40 EXIT 62A
W IH 40 (EXIT RAMP)
IH 40
Unnamed Basin
CW-WA
Unnamed Stream
CW-WM*
SLEEPY HOLLOW BLVD
ELMHURST RD
SW 34TH AVE
P15-HH
FULTON DR
P6-FW
CP15-H2
CP5-SH
VAN WINKLE DR
P5-CO
CP5-WM
P5*
Playa Lake 5 (McDonald Lake)
Playa Lake 3
SW 45TH AVE
SONCY
HILLSIDE RD
NW 15TH AVE
Playa Lake 4
CP4-HE
HELIUM RD
P7
Playa Lake 7
ARDEN RD
P14
Playa Lake 14 (Diamond Horseshoe Lake)
CULV
LAMOUNT DR
SCOTTY DR
CP7-CO
LOOP 335 WEST
LOOP 335 SOUTH
FM 2186
Playa Lake 8
Playa Lake 9 (Spring Draw)
FM 2088
S COULTER ST
HOLLYWOOD
Playa Lake 11
Playa Lake 13
IH 27 EXIT 116
(ACCESS RAMP)
(EXIT RAMP)
IH 27
BELL ST
TECKLA BLVD
S WESTERN ST
JANET DR
PARAMOUNT BLVD
QUEEN BLVD
P6-OE
PLAYA LAKE 6 (Lawrence Lake)
3629
3629.3999
CP6-OL
P6-TS*
P6-TS
SW 26TH AVE
ELMWOOD DR
IMMANUEL RD
SW 24TH AVE
SE 24TH AVE
SE 26TH AVE
S HARRISON ST
CANYON DR (IH 27)
SW 34TH AVE
S TYLER ST
SE 34TH AVE
MOSS LN
P17
P17*
Playa Lake 17 (Bennett Lake)
S VIRGINIA ST
S WASHINGTON ST
Playa Lake 19 (Santa Fe Lake)
SE 46TH AVE
SW 46TH AVE
JACKSON DR
PARKER ST
REPUBLIC AVE
SHAWNEE TRL
P16
Playa Lake 16 (Willow Grove Lake)
DARRELL AVE
P16-RH
P15-HH
SW 58TH AVE
SE 58TH AVE
P15
P15-FE*
Playa Lake 15 (McCarty Lake)
P15-CA
W FARMERS AVE
FM 1541
Playa Lake 18
FM 1541 (S WASHINGTON ST)
LOOP 335 SOUTH
S GEORGIA ST
LA FAYETTE LN
W SUNDOWN LN
BEACON RD

Task 4 Drainage Criteria Evaluation

4.1 Background

The City's current Stormwater Management Criteria Manual was developed as part of the 1993 Stormwater Management Master Plan. The primary focus of this evaluation is on the City's drainage policy (Section 1 of the manual) to assess flood hazard mitigation service levels associated with drainage infrastructure capacity requirements for new development activity, financial responsibility of the City for off-site improvements associated with new land development, and design storm depth-duration-frequency specifications. Recommendations are made to improve the level of drainage service for the City. A discussion of infrastructure cost impacts associated with the higher standards recommendation is also included.

The following is a summary of the major requirements of the City's current drainage policy/criteria:

Street Drainage Capacity

- 2-year storm capacity curb-curb, # open lanes varies with roadway class: Local & Collector-Flow to crown, Arterial-two lanes dry, Freeway-all lanes dry
- 100-year, 1.5 foot above curb, < 1 foot over crown for arterial roadways, no inundation allowed for freeways
- Building FFE > 100-year WSEL , no minimum freeboard specified

Open Channel Capacity

- 5-year capacity in pilot channel
- Building FFE > 100-year WSEL , no minimum freeboard specified

Culvert/Bridge Capacity

- 25-year, WSEL below roadway
- 100-year, WSEL over roadway, <1.5 feet, < 1.0 feet, varies with roadway class

Playas

- Building FFE +1 foot > 100-year WSEL (FEMA-NFIP BFE)

Easement Requirements

- 20 feet on both sides of open channels

Developer Responsibility

- City responsible for off-site improvements if funds available.

Detention

- 2 and100 year, Pre = Post Q

To provide a comparison with other west Texas municipalities, drainage policy/criteria information was compiled for the cities of Abilene, El Paso, Laredo, Lubbock, Odessa, San Angelo and Wichita Falls. This information was secured from the city web sites. The information secured from the city web sites is in the **Data Appendix** along with summary notes on each city's policy/criteria.

Amarillo's standards for street drainage are less stringent than any of the seven cities surveyed. *Since Amarillo's street drainage system is the primary storm water runoff conveyance infrastructure system, this issue is the main focus of the policy/criteria recommendations.*

4.2 Street Drainage

The following table summarizes street drainage criteria for the surveyed cities in comparison to Amarillo.

Table 4-1: Street Drainage Capacity

City	Street Drainage Capacity	
	Minor Storm	**Major Storm**
Amarillo	2-year curb to curb	100-year, WSEL<1.5 foot above curb FFE> 100-year WSEL
Abilene	5-year curb to curb	100-year, within ROW
El Paso	25-year, curb to curb	100-year, within ROW or curb to curb, varies with roadway class
Laredo	10-year, curb to curb	N/A
Lubbock	5-year curb to curb 25-year, capacity at sag inlets	100-year, WSEL <0.5 foot above curb, safe overflow path required FFE> 0.5 foot above 100-year WSEL
Odessa	5-year curb to curb 25-year, capacity at sag inlets	100-year, WSEL< 1 foot above curb, within ROW
San Angelo	2-year curb to curb	100-year, WSEL< 0.16 foot above curb, within in ROW or WSEL < 1 foot above curb, FFE > 0.5 foot above WSEL
Wichita Falls	10-year curb to curb	100-year, WSEL <0.5 foot above curb, within ROW or FFE> 0.5 foot above WSEL

An evaluation was performed to assess the ability to contain 100-year flows within ROW limits with nominal grading of the ROW outside of curb limits to the roadway. For this evaluation, street and ROW flow capacities are estimated using Equation 3-1 from the City of Amarillo Storm Water Management Criteria Manual (SWMCM). For this analysis, a typical cross sectional geometry was assumed, including a curb-to-curb street width of 30 feet, curb height of six inches, crown height of six inches, and longitudinal slope of 0.4%, as well as a right-of-way width of 50 feet with a cross slope of 2% above the top of curb. The street flow capacity with no curb overtopping is **21 cfs**. The flow capacity of the combined total of the ROW area outside of the curb limits and the street flow capacity with depth 0.2 feet above curb is **50 cfs**. This was calculated by adding the flow area between the curbs (calculated using Equation 3-1 with a correction factor applied since depth exceeds the crown height) to the additional flow within the ROW outside the curbs (calculated using Equation 3-1).

Table 4-2: Street Capacity Calculations

Street Capacity (cfs)

Z =	30	SWMCM Eq. 3-1
n =	0.016	Q_{curb} = 10.4
S =	0.004	
d =	0.5	
		2 x Q_{curb} = **Q_{street}** = **20.9**

Street + Right-of-Way Capacity (cfs)

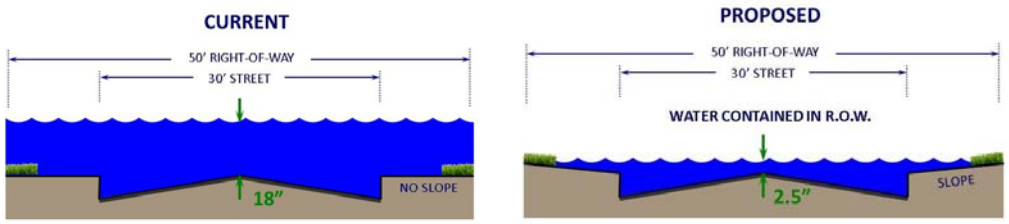
Z =	30	SWMCM Eq. 3-1*
n =	0.016	Q_{curb} = 24.2
S =	0.004	
d =	0.71	
Z =	48	SWMCM Eq. 3-1
n =	0.03	$Q_{outsidecurb}$ = 0.9
S =	0.004	
d =	0.21	
		2 x (Q_{curb} + $Q_{outsidecurb}$) = **Q_{ROW}** = **50.0**

**correction factor applied to account for flow depth above crown*

In order to evaluate the level of service provided within the ROW, it is assumed that the 2-year flow is conveyed within the street below the top-of-curb. Therefore, the 2-year flow for this analysis is equal to the street flow capacity of 21 cfs. Relative differences between the 2-year flood flow and the 5-, 10-, and 100-year flood flows are estimated using the storm depth-duration-frequency data analysis presented in the "Cost Impacts" section later in this report. These relative difference factors (1.3, 1.5, and 2.2) are applied to the 2-year flood flow, resulting

in 5-, 10-, and 100-year estimated flood flows of 27, 31, and 46 cfs, respectively. *Since the estimated flood flows are all less than the total roadway + ROW flow capacity of 50 cfs, the assumed typical street and 2% grade sloped-to-street ROW cross section geometry provides a 100-year level of service within the ROW based on a 2-year level of service within the street. Any higher level of street drainage service would reduce the depth of water on the street surface in comparison to 2-year service.*

Figure 4-1: Current vs. Proposed Street Cross-Section Geometry Comparison



Recommendations

- Increase Minor Storm street drainage capacity standards from the current 2-year storm to 5- or 10-year storm contained curb-to-curb,
- Increase Major Storm (100-year storm) street drainage capacity standards to require flow to be contained within ROW/easement for street systems associated with new land development to assure safe conveyance of extreme flows to receiving water bodies/waterways,
- Maximum pavement encroachment limits
  - Minor storm: No change to current criteria
  - Major storm:
    - Local and Collector: depth $\leq$ 0.5 foot above crown but within ROW
    - Arterial: no water over crown
    - Freeway: no change to current criteria

4.3 Open Channel Capacity

The following table summarizes open channel sizing criteria for the surveyed cities in comparison to Amarillo.

Table 4-3: Open Channel Capacity

City	Open Channel Capacity
Amarillo	5-year
Abilene	10-year + freeboard 100-year within easement/ROW
El Paso	100-year + freeboard
Laredo	25-year, full development
Lubbock	100-year, full development
Odessa	50-year
San Angelo	100-year + freeboard, full development 100-year within easement/ROW
Wichita Falls	10-year + freeboard in channel 100-year within easement/ROW

Recommendations

Increase open channel capacity standards to 25-year storm contained in channel with 1 foot freeboard; require easement limits to contain 100-year storm flows. Additionally, future full-development land-use conditions hydrology is recommended for hydraulic capacity analysis of all drainage infrastructure (channels, storm drain systems, culverts/bridges) to ensure adequacy to accommodate future City growth.

4.4 Culvert/Bridge Capacity

The following table summarizes culvert/bridge capacity criteria for the surveyed cities in comparison to Amarillo.

Table 4-4: Culvert/Bridge Capacity

City	Culvert/Bridge Capacity
Amarillo	25-year, WSEL below roadway 100-year, WSEL < 1.5-1.0 foot over roadway, varies with roadway class
Abilene	25/100-year, WSEL below roadway, varies with roadway class
El Paso	100-year, WSEL below roadway for culverts 100-year, WSEL > 1 foot below low chord for bridges
Laredo	25-year, WSEL > 1 foot below roadway for culverts 25-year, WSEL > 1 foot below low chord for bridges
Lubbock	25/100-year WSEL below roadway, varies with roadway class
Odessa	25-year, WSEL below roadway
San Angelo	2-year, WSEL < top of pavement for culverts or > 1 foot below low chord for bridges 100-year, WSEL < 1 foot above pavement low point for culverts or below low chord for bridges
Wichita Falls	10-year, below top of curb 100-year, WSEL < 1 foot above pavement low point for culverts or > 1 foot below low chord for bridges

Recommendations

Increase Major Storm criteria (100-year storm) to be consistent with or better than street drainage capacity recommendations:

- Local and Collector: depth $\leq$ 0.5 foot above crown, better: no water on roadway or water below low-chord
- Arterial: no water over crown, better: no water on roadway or below low-chord
- Freeway: no water on road

4.5 Easement Requirements

The following table summarizes drainage easement requirements for the surveyed cities in comparison to Amarillo.

Table 4-5: Drainage Easements

City	Drainage Easements
Amarillo	20 feet each side open channels
Abilene	100-year limits, minimum 15 feet
El Paso	Floodway limits, 12 feet each side open channels
Laredo	Floodway limits, minimum 15 feet
Lubbock	20 feet minimum for pipe systems Floodway limits, minimum 10 feet each side of open channels
Odessa	N/A
San Angelo	100-year limits
Wichita Falls	100-year limits, minimum 15 feet

Recommendations

In addition to the current minimum 20-foot requirement, require additional easement/ROW to contain the limits of 100-year storm flows.

4.6 Detention Requirements

The following table summarizes detention requirements for the surveyed cities in comparison to Amarillo

Table 4-6: Detention Requirements

City	Detention
Amarillo	2- & 100-year, pre=post
Abilene	2- & 100-year, pre=post
El Paso	100-year
Laredo	50-year, pre=post
Lubbock	N/A
Odessa	N/A
San Angelo	2- & 100-year, pre=post
Wichita Falls	2- & 100-year, pre=post

Recommendations

No change to current criteria. On-site detention for development should be considered on a case-by-case basis. One of the main challenges associated with implementing on-site detention requirements for development with very flat terrain is the availability of an adequate storm water outfall. The volume excavation required to construct a detention pond may necessitate the use of mechanical pump discharge systems.

The purpose of on-site detention is to mitigate the increase in peak flow rate from a site inherent with the addition of impervious area. Even with on-site detention in place, there is an increase in the runoff volume from sites. Further downstream in a developed watershed, the effects of on-site detention are diminished and conveyance becomes more important. For the playa watersheds, it may be more effective to focus on storm water conveyance rather than storm

water detention because of flat topography and because all runoff terminates into the lakes serving as retention storage. For development in the East and West Amarillo Creek watersheds where there is more relief and drainage is tributary to natural channel systems, detention should be applied.

4.7 City/Developer Financial Responsibility

The following table summarizes financial responsibility requirements for the surveyed cities in comparison to Amarillo.

Table 4-7: Financial Responsibility

City	City/Developer Fiscal Responsibility
Amarillo	City responsible for off-site improvements and on-site improvements to manage contributary off-site flows, if funds available
Abilene	Developer responsible for on-site and off-site improvements
El Paso	Developer responsible for on-site and off-site improvements
Laredo	Developer responsible for off-site improvements and must convey contributary flows
Lubbock	Developer responsible for on-site and off-site improvements
Odessa	Developer responsible for on-site and off-site improvements
San Angelo	City may cost participate for capacity is excess of minimum Developer must convey contributary off-site flows
Wichita Falls	City may cost participate for capacity is excess of minimum

Recommendations

Amarillo assumes a high level of fiscal responsibility for off-site improvements in comparison to the surveyed cities; the City should re-visit the basis for this policy in conjunction with the implementation of the Drainage Utility.

4.8 Cost Impacts for Increased Service Levels

Construction cost impacts associated with management of 5-year and 10-year flows curb-to-curb in roadways were developed by estimating the increase in stormdrain system flow capacity

needs in comparison to 2-year storm water runoff flows and then using this information to determine increased pipe size and associated construction cost.

An evaluation of the depth-duration-frequency data in Table 2-6 of the Amarillo Storm Water Management Criteria Manual comparing the ratio of depths for durations of 5 to 120 minutes (typical for storm drain design) for the 2-, 5-, and 10-year storms indicates the following:

- 5-year/2-year, ratio ~1.3
- 10-year/2-year, ratio ~1.5

Table 4-8: Depth Duration Frequency Data

Amarillo Storm Water Criteria Manual Table 2-6 Depth-Duration-Frequency Data							
Duration (Min)	2-yr	5-yr	Ratio 5/2	10-yr	Ratio 10/2	100-yr	Ratio 100/2
5	0.45	0.54	1.2	0.60	1.3	0.84	1.9
10	0.69	0.86	1.2	0.97	1.4	1.41	2.0
15	0.85	1.08	1.3	1.23	1.4	1.81	2.1
30	1.18	1.53	1.3	1.77	1.5	2.65	2.2
60	1.52	2.00	1.3	2.33	1.5	3.52	2.3
120	1.65	2.15	1.3	2.48	1.5	3.80	2.3
		Average	1.3		1.5		2.2

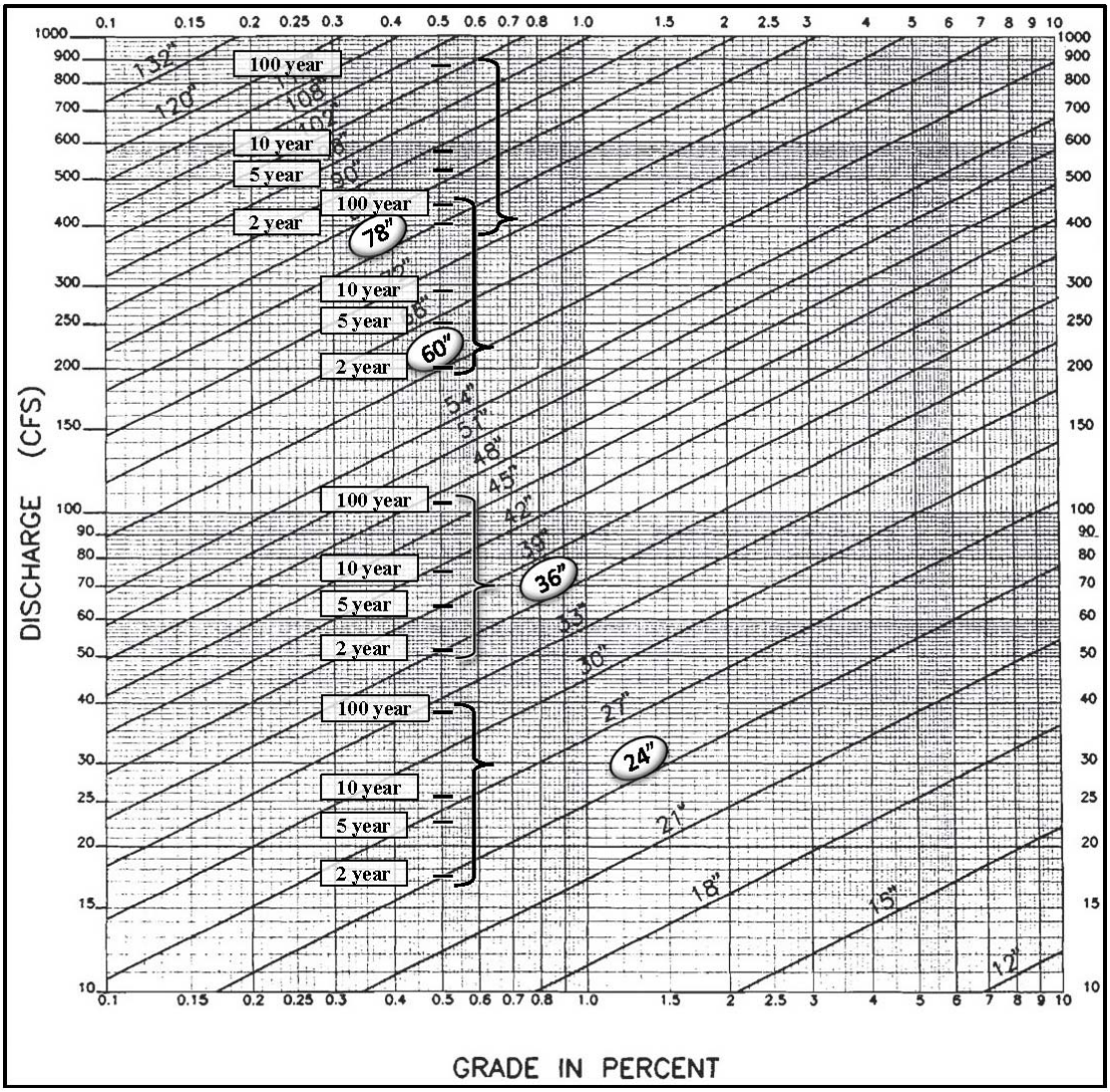
The ratios are relatively constant independent of duration. Therefore, a storm drain system designed to convey 5-year storm flows must have a capacity 30% greater than a system designed to convey 2-year storm flows. Likewise, a system designed to convey the 10-year storm must have a capacity 50% greater than a system designed to convey the 2-year storm.

To assess construction cost impacts, the increase in required pipe sizes were determined using the discharge capacity for concrete pipe flowing full data presented in Figure 4-1 (from Figure 5-5 of the Amarillo Storm Water Management Criteria Manuel). For 0.1-0.5% grade:

- 2-year flow, **24”** pipe ► 5-year flow, **27”** pipe & 10-year flow, **30”** pipe
- 2-year flow, **36”** pipe ► 5-year flow, **39”** pipe & 10-year flow, **42”** pipe
- 2-year flow, **60”** pipe ► 5-year flow, **66”** pipe & 10-year flow, **72”** pipe
- 2-year flow, **78”** pipe ► 5-year flow, **~84”**pipe and 10-year flow, **90”** pipe

Figure 4-2: Design Storm Impact on Pipe Sizing Requirements

Amarillo Storm Water Criteria Manual Figure 5-5
Discharge Capacity for Concrete Pipe Flowing Full



Unit cost for installed pipe from the drainage system inventory:

24” RCP-$55/ft
27”RCP-$55/ft
30”RCP-$60/ft
36”RCP-$70/ft
39”RCP-$85/ft
42”RCP-$100/ft
60”RCP-$160/ft
66”RCP-$190/ft
72”RCP-$220/ft
78”RCP-$255/ft
84”RCP-$315/ft
90”RCP-$340/ft

Summary of Construction Cost Impacts

Using these unit cost values, storm drain system construction cost increase for **5-year** storm flows is estimated at **~ 25%** and for **10-year** flows, **~ 40%.** These cost increases account for the increases in pipeline sizes and in the number of curb inlets and laterals.

4.9 Design Storm Depth-Duration-Frequency Specifications

The table below provides the most current rainfall depths for various storm events and durations for the City. This data is sourced from the *Atlas of Depth-Duration Frequency of Precipitation Annual Maxima for Texas* published by the USGS in 2004. This USGS document does not include precipitation depths for storm event durations of less than 15 minutes. The rainfall depths for the more frequent events are slightly lower than those currently shown in the City's criteria manual. The rainfall depths for the less frequent events are slightly higher than those currently shown in the City's criteria manual.

Table 4-9: Amarillo Rainfall Depth Duration Frequency

	Rainfall Depths (inches)						
Duration	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	*Recurrance Interval*
(minutes)	50%	20%	10%	4%	2%	1%	*% Annual Chance Exceedance*
15	0.73	1.00	1.2	1.5	1.7	2.0	
30	1.0	1.4	1.6	2.1	2.3	2.7	
60	1.2	1.7	2.1	2.6	3.1	3.6	
120	1.4	2.0	2.5	3.2	3.8	4.4	
180	1.5	2.2	2.6	3.3	3.9	4.7	
360	1.7	2.4	2.8	3.6	4.3	5.0	
720	1.9	2.5	3.2	4.0	4.8	5.5	
1440	2.3	3.2	4.0	4.9	5.6	6.6	

Task 5 Needs Assessment Summary

Provided to City June 27, 2011

5.1 Drainage Management Challenges

The City of Amarillo (City) has extensive storm-water drainage management needs as evidenced by the large number of citizen drainage problem reports during 2010 when rainfall was significant. The map presented in **Appendix 5A** to this section indicates the locations of these drainage problems reported from January 2010 through May 2011. For several years, the City has been considering the evaluation of a Drainage Utility to fund the City's drainage management activities, first with the Development Policy Review Committee and more recently in the 2010 Comprehensive Planning process. The City's major drainage management needs are summarized as follows:

5.1.1 Drainage Improvement Project Planning and Implementation

The City completed the Storm Water Management Master Plan (Master Plan) in 1993, which identified drainage improvement projects to reduce flood hazards throughout the City. Additionally, the Master Plan included the development and adoption of technical design criteria for new drainage infrastructure to ensure consistent drainage management requirements for land development activity. Since the completion of the Master Plan, the City has identified additional drainage improvement projects. Currently, there are a total of fifty-five (55) projects for which preliminary engineering evaluation and cost estimation have been completed. The total design and construction costs for these projects is $66,000,000 in year 2011 dollars. In contrast, the City has constructed only four (4) of the recommended projects since the completion of the Master Plan in 1993. *The lack of stable funding has severely limited implementation progress for the identified capital improvement projects.*

5.1.2 Drainage Infrastructure Maintenance

The City also has a significant inventory of existing drainage infrastructure that requires periodic cleaning, rehabilitation and replacement. The City's drainage system includes over 180 miles of storm drain pipe and roadway culverts, 15 miles of constructed ditch/channel and over 3,300 curb inlets. The replacement cost for the constructed infrastructure now in place is approximately $160,000,000. Constructed infrastructure is generally targeted for a service life of 50 years. Much of the existing infrastructure is beyond this age and pipe failures/cave-ins do occur. There is a need for a proactive

maintenance program that includes: 1) infrastructure evaluation to determine structural condition, 2) replacement/rehabilitation before failure and 3) regular debris/sediment/trash/vegetation removal. Currently, the Street Department performs drainage infrastructure maintenance activities on a reactive basis in response to failures and complaints. *There is a need for a dedicated work group to provide focused drainage infrastructure maintenance services*.

5.1.3 Drainage Infrastructure Design Criteria

As stated previously, the City's current drainage infrastructure design criteria was adopted in 1993. The requirements for street drainage capacity are less stringent than other large west Texas municipalities. There is a need to revisit street drainage capacity requirements for new development and for flood-hazard-reduction drainage projects. This review and criteria modification will allow the City to better manage street water depth and overflow conditions that occur during large storm events. *In considering changes to the technical criteria, the desire to improve roadway drivability during storm events and first responder access must be balanced with infrastructure cost increases associated with additional drainage capacity.*

In order to provide reliable funding to meet the City's drainage management needs identified above, a Drainage Utility is being considered by the City.

5.1.4 The Drainage Utility

A Drainage Utility is a user-fee-based funding mechanism for municipal drainage management services. The user-fee is proportional to service demand similar to water, wastewater and solid waste services. The two major advantages over continued reliance on monies from the General Fund for drainage services are: 1) the establishment of a dedicated, long-term funding stream dedicated specifically for drainage management and 2) customer user-fee equity. User-fees are assigned to property parcels based on storm-water runoff characteristics, not property value. The amount of impervious area such as rooftops, driveways and parking areas is used to assign Drainage Utility user-fees to all developed properties, both residential and commercial, within the City. The placement of impervious area on land increases both the flow rate and volume of runoff; it is the single most significant land use characteristic in terms of demand placed on drainage infrastructure to convey storm-water runoff flows.

There are over sixty (60) municipal drainage utilities in the state of Texas. The Texas Local Government Code (Chapter 552.C) governs utility implementation and operation. Drainage Utility implementation requires a cost-of-service study to allocate drainage system operation and capital project costs to developed land parcels, incorporation of customer billing information into the City's utility billing system, and the adoption of two ordinances by the City Commission. The ordinances declare the City's drainage system to be a public utility, establish an enterprise fund to ensure that revenues are used only for drainage management purposes, detail how user-fees are assigned to properties, specify user-fee exemptions allowed by law, and specify the customer appeals process to address any concerns about user-fee assignment accuracy.

5.2 Project Work Plan and Schedule

A Drainage Utility Study is underway to address the requirements listed above. The Drainage Utility Study includes the following major work elements:

- Drainage Network Analysis - Inventory of drainage infrastructure and replacement cost determination.
- Drainage Maintenance Analysis - Staff and equipment additions to support proactive maintenance, rehabilitation, and replacement of infrastructure.
- Storm Water Master Plan Analysis - Project costs and implementation priority update to year 2011 and incorporation of projects identified by the City since Master Plan completion in 1993.
- Drainage Criteria Analysis - Identification of technical criteria enhancements to improve the level of drainage management service for new land development and for flood hazard reduction projects with primary focus is on street drainage capacity.
- Needs Assessment Summary - Summary of the four work tasks above provides drainage management cost detail for input to the cost-of-service financial analysis.
- Utility Billing System Evaluation - Assess capability of the City's utility billing system to incorporate Drainage Utility user-fee collection and establish process for customer land data transfer into the billing system.

- Land parcel Impervious Area Determination - Use land parcel records from the Potter-Randall Appraisal district and available aerial photography to extract parcel-specific data on impervious coverage and land area.
- Customer Rate Structure Recommendation - Establish Equivalent Residential Unit (ERU) impervious area standard for user-fee assignment to commercial properties, establish customer tiers for single-family properties, and establish Drainage Utility revenue potential.
- Exemptions Evaluation - Evaluate utility revenue impacts/subsidy associated with the allowable discretionary exemptions: City, County, School District and Religious properties.
- Multi-Year Financial Analysis - Enterprise fund analysis to establish customer rates, assess affordability, and ability to support bond issuance for drainage management project construction.
- Stakeholder Input and Public Outreach - The Comprehensive Plan Implementation Advisory Committee will serve in an advisory capacity throughout the study. Additionally, resources will be posted on the City's web page and public meetings will be conducted to provide information on the Drainage Utility concept and to solicit public input on drainage project and maintenance needs.

The study will be completed by November 2011. At that point, the City will have the information to make a decision on Drainage Utility implementation. Implementation would require the passage of the two ordinances and incorporation of customer data into the City's utility billing system for user-fee collection.

5.3 Program Funding Comparison

Currently, City funding for drainage management does not meet community needs. For comparison, the following information is provided for municipalities in west Texas that rely on Drainage Utility funding. The first column includes the typical monthly billing rate for single-family property, the second column shows annual revenue on a per capita basis, and the third column provides annual revenue per square mile of city incorporated area. Additionally, most of these cities are supporting bond debt with utility revenue to fund large-scale construction projects. The City of Amarillo's current funding for drainage management activities is well below these values.

Table 5-1: Texas Drainage Utility Comparison

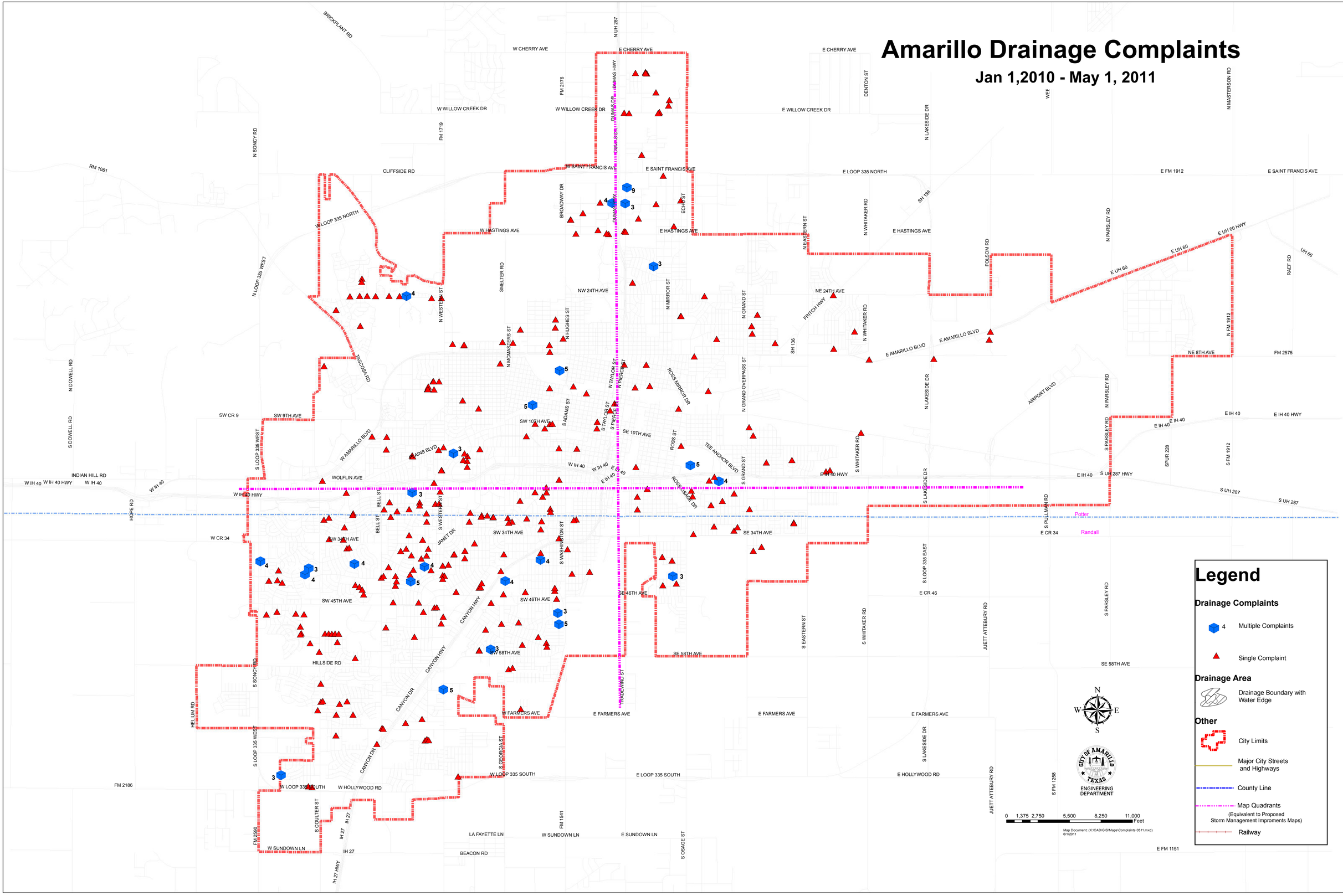
City/ERU Monthly Rate	Annual Revenue Per Person	Annual Revenue Per Square Mile
Abilene/$2.45	$16	$17,000
El Paso/$2.97	$23	$60,000
Fort Worth/$5.40	$43	$109,000
Laredo/$6.50	$28	$83,000
Lubbock/$12.00	$72	$145,000
San Angelo/$4.00	$30	$48,000
Wichita Falls/$3.55	$24	$37,000

Appendix 5A

Amarillo Drainage Complaints Map

Amarillo Drainage Complaints

Jan 1,2010 - May 1, 2011



Legend

Drainage Complaints

- 4 — Multiple Complaints
- Single Complaint

Drainage Area

- Drainage Boundary with Water Edge

Other

- City Limits
- Major City Streets and Highways
- County Line
- Map Quadrants (Equivalent to Proposed Storm Management Improments Maps)
- Railway

N W E S

CITY OF AMARILLO TEXAS
ENGINEERING DEPARTMENT

0 1,375 2,750 5,500 8,250 11,000 Feet

Map Document: (K:\CAD\GIS\Maps\Complaints 0511.mxd)
6/1/2011

Task 6 Utility Billing System Evaluation

6.1 Matching Process

The matching process involved creating and filtering the database of the PRAD 2010 Appraisal Roll so that its format matched that of the Amarillo Billing System file received on April 20, 2011. This involved joining and manipulating different appraisal roll files so that the data needed for the analysis lined up horizontally under descriptive fields with each line in the database representing one unique tax account record. The common field by which the two were joined is the tax account id. Before this could happen, a few cleanup measures were enacted. First, both fields were queried to remove extra spaces and punctuation as well as to arrange the tax ids so that they were in the same format. (010101010101R) Next, duplicate entries based on the tax id field were removed from both databases. This resulted in a 2010 PRAD appraisal roll database and Amarillo Billing System database that had unique tax id numbers for every account listing. Amarillo billing system accounts with no tax id or a temporary tax id were removed in this process as well. The following are the results of the matching effort.

6.2 Billing System Summary

Number of records in billing system (April 20, 2011) - 70,015

- Number of records with temporary tax id number - 1,345 (~2%)
- Number of records without tax id number - 2,697 (~4%)
- Number of duplicate billing system accounts that will be given a No Bill (NB) code - 3,886 (~5%)
- Number of unique, or unduplicated, billing system records with tax id - 62,087 (~89%)

6.3 Matching Results

6.3.1 Billing System

Number of unique billing system records matched to PRAD 2010 account records - **61,477 (~88%)**

- Number of billing system accounts without a match - 8,538 (~12%)
- Number of unique billing system accounts that have tax id without a match - **610 (~1%)**

6.3.2 PRAD Appraisal Roll

Number of unique PRAD 2010 account records (February 3, 2011) - 79,460

- Number of unique PRAD 2010 account records without a match - 17,983 (~23%)

- Number of unique PRAD 2010 account records without a match when vacant parcels are removed - **10,198 (~13%)**

6.4 Possible Inaccuracies

Over time, the information contained in the Drainage Utility billing system will become more accurate as it is implemented, owner appeals take place, and better impervious area information is gathered and incorporated. The following are types of inaccuracies that may be expected from relying on appraisal roll data as the principal source of information to populate the billing system.

- Errors in the land use category indicated by the PCA_CD code in the appraisal roll.
- Inaccuracy in the square footage indicated by the base and xfob feature subtotals.
- With only one tax account per utility customer in the billing system, additional properties tied to that billing account but with a different tax id will not be picked up.
- Compacted surfaces are not accounted for in the impervious area subtotals found in the appraisal roll.
- Properties that have a land use code indicating possible surface improvements with no impervious area listed in the appraisal roll.
- Properties identified as “Vacant” in the appraisal roll that have impervious area.

6.5 Format for Data Transfer

The fields needed to add Drainage Utility information for each customer in the billing system can be as few as the following four:

- Rate Class (i.e., Residential Classes as **R1**,**R2**,or **R3**; Commercial Classes as **CM ;** No-Bill as **NB**)
- Impervious Area
- Number of Equivalent Residential Units (ERUs)
- Monthly Charge

6.6 Data Refinement Considerations before First Billing

- Non-Residential and Tax-exempt properties’ impervious area not fully accounted for in PRAD including compacted surfaces. (8,270 Parcels)
- Properties in Billing System that do not have a match in PRAD 2010 Roll. (610 Parcels)
- Properties in PRAD 2010 Roll with land use codes other than “Vacant” that do not have a Billing System match. (10,198 Parcels) This is the result of one of the following situations:

  - Additional properties served by a single billing system account are not identified with the main tax id used to identify that customer account.
  - Developed properties currently receive no City utility services and have no existing account in the billing system.
- Properties in PRAD 2010 Roll that have land use code that indicates “Vacant” but have impervious area associated. (125 Parcels)
- Properties in PRAD 2010 Roll that have land use code other than “Vacant” but have no impervious area associated. (3,248 Parcels)
- Properties added to PRAD or Billing System since February 3, 2011 and April 20, 2011, respectively.
- Properties that were not identified by PRAD as within City Limits.

6.7 Drainage Utility Master Customer Data File Transfer

The master Drainage Utility customer data file populated with account specific impervious area values and number of Equivalent Residential Units developed in Task 8 was delivered to the City on October 12, 2011. The data set is the result of matching Potter-Randall Appraisal District appraisal-roll data (file date February 3, 2011) for land parcel specific impervious area with existing utility account records (file date April 20, 2011).

The data set includes:

- Tax identification number
- Utility Billing Account Number
- Customer Rate Classification-R1,R2,R3, CM
- Impervious Area-Square Feet
- Number of Equivalent Residential Units

The data was provided in comma separated format (.csv). This file is included in the **Data Appendix.**

Task 7 Customer Service Recommendations (In Development)

Procedures will be developed for administration of customer billing system records and for processing customer appeals. The procedures will specify the data customers should provide for user-fee adjustment consideration as follows:

- Customer appeal resolution procedures
- Customer credit procedures (if appropriate)
- Establishing accounts for new land development at Certificate of Occupancy issuance
- Customer records maintenance procedures
- How to assign the user-fee to a single property served by multiple City utility accounts
- Billings process for unoccupied property
- Billings process for developed properties not receiving other City utility services
- Evaluation of exemption requests for private drainage systems
- Accommodating future annexations

Task 8 PRAD Land Data Quality Review and Supplemental Impervious Area Determination

The quality and accuracy of the land parcel impervious area data contained in the Potter-Randall Appraisal District (PRAD) retrieved on February 3, 2011, was evaluated. There are a total of 80,262 records in the data set within the City municipal limits. PRAD land use descriptions and improvement descriptions that reflect impervious area were used to segregate and analyze the data. Land use descriptions were used to group land parcel records by dominant land use to allow evaluation of the Equivalent Residential Unit (ERU) value and the amount of impervious area associated with major land use classes. The accuracy of the PRAD impervious area data was evaluated using aerial photography based measurement or comparison on 450 land parcels. Additionally, since the PRAD data does not include residential driveway/walkway area, aerial photography was used to establish a value for incorporation into the ERU determination. Additional data collection needs are identified to support the development of an accurate customer data set prior to first billing.

8.1 Data Sources

- CityLimit.shp – a polyline shapefile describing the City limits.
- Tax_Account.shp – a polygon shapefile containing tax record boundaries and account numbers.
- Aerial Imagery – 2010 1-foot aerial imagery in MrSID format.
- PRAD Appraisal Roll – 80,262 records within the City of Amarillo.
- Billing System Data – 70,015 records within the City of Amarillo.

8.2 PRAD Appraisal Database

A database was first constructed from the separate .txt files provided by PRAD in MS Access using queries. Each .txt file contains a portion of a complete tax record such as building area, extra feature area, name, address, and use description that must be joined to the unique tax account code assigned to each parcel in the PRAD two-county service area. The two-county dataset was reduced to include only parcels within the city limits of Amarillo by limiting the query to only those with a City of Amarillo tax code. Records were combined and aggregated into unique accounts by using complex visual basic queries so that a single tax account number is populated with multiple properties. A description of improvement types, areas per type, and land use was associated with each record via this process. Impervious area was determined for each

parcel based on the values given for the building and extra feature descriptions listed for each account. A total impervious area value per tax account was summed from the area records of these feature descriptions that were found to represent impervious area. These feature descriptions are listed in Section 8.3: Quality Review.

8.2.1 Summary Table

Table 8-1 is an aggregate summary of the values found in the appraisal roll database by land use code. The Property Use Code (PCA_CD) was used to query the database for land uses and summarize them based on total number of parcels, average impervious area, total impervious area, total ERUs, and percentage of ERUs. The land uses are placed into one of two major categories: Single-Family Residential and Non-Residential. The PRAD Property Use Codes can be found in **Appendix 8A** to this section.

8.2.1.1 Single-Family Residential

The average amount of impervious area for all parcels in the *Single-Family Home* land use class, 2,800 ft^2, represents the Equivalent Residential Unit (ERU). All Single-Family properties have had a 698 square feet driveway/walkway value added to them because the appraisal roll does not include these features for this land use class. The ERU value and driveway/walkway value is discussed in more detail later in this section and in Task 9. *Condo* and *duplex* land uses are placed in the Single-Family Residential (SFR) category. *Mobile Homes* that occupy lots that are owned or rented by the occupant and are located outside of commercial mobile home parks fall into this category as well. The value for average impervious area for duplexes has been divided by two to account for two dwelling units.

8.2.1.2 Non-Residential

All uses summarized below are based on the PRAD 2010 appraisal roll PCA_CD except *BNSF* and *Higher Learning*. The value for *BNSF* is the parcel area of the rail yards since the entirety of the area is composed of compacted parking and rail impervious surface which is not contained in the PRAD roll. *The Higher Learning* land use class was simply pulled from the *School District* class based on names of universities and colleges. The Non-Residential land uses that are exempt under State law from paying Drainage Utility user-fees have been noted below. Mobile Homes that fall within commercial mobile home parks are considered *Commercial* and are accounted for under that land use class.

Table 8-1: PRAD Summary Table

		Total Parcels	Average Impervious Area (ft^2)	Total Impervious Area (ft^2)	Total ERUs 1 ERU = 2,800 ft^2	Percentage of ERUs
Single-Family Residential		**63,005**		**164,600,840**	**64,702**	**45%**
Tier I (< 2,072 ft^2)	Duplexes*	1,247	1,230	3,065,690	1,696	2.6%
	Mobile Homes	2,716	1,893	3,514,905	1,847	2.9%
	Condos	264	1,966	519,047	180	0.3%
	Single-Family Houses	15,920	1,783	25,342,236	10,826	16.7%
Tier II (2,072 - 3,236 ft^2)	Single-Family Houses	28,551	2,638	75,318,292	28,551	44.1%
Tier III (≥ 3,237 ft^2)	Single-Family Houses	14,307	3,979	56,840,670	21,604	33.4%
Non-Residential		**16,455**		**228,144,214**	**79,793**	**55%**
	Government	415	76,550	15,062,250	4,579	6%
	City	328	69,697	8,084,900	2,887	63%
	County	23	170,458	3,409,154	1,218	27%
Exempt	State	49	67,938	2,241,956	*Exempt*	*Exempt*
	Federal	15	110,520	1,326,240	474	10%
	Commercial	6,550	27,171	163,149,473	58,145	73%
	BNSF**	10	906,018	9,060,176	3,236	4%
	Multifamily	806	20,129	15,317,827	5,471	7%
	School District	156	115,766	10,071,663	3,597	5%
Exempt	Higher Learning	91	24,868	2,138,666	*Exempt*	*Exempt*
	Religious	642	29,717	13,045,865	4,659	6%
	Vacant	7,785	2,386	298,294	107	0.1%
Total		**79,460**		**392,745,054**	**144,495**	**100%**

* Each parcel is counted as two living units

* *This value represents total parcel land area of BNSF Railyards only

8.3 Quality Review

8.3.1 Assure that all PRAD feature classifications related to Impervious Area have been accounted for.

The following is a list of all PRAD Building and Extra Feature descriptions that were found to represent Impervious Area.

Building Descriptions

- Additions
- Addition One
- Addition Two
- Addition Three
- Addition Four
- Addition Five
- Barn
- Base
- Breezeway
- Canopy
- Covered Patio
- Covered Porch
- Deck
- Dock

Extra Feature Descriptions

- Asphalt
- Building
- Carport
- Concrete
- Cpatio
- Deck
- Detached Garage - Concrete Block
- Detached Garage - Earth Shelter
- Detached Garage - Masonry Veneer
- Detached Garage - Siding/Shingle
- Detached Garage - Stucco
- Garage
- Mobile Home
- No Value Feature

- Garage
- Glassed-In Porch
- Greenhouse
- Mobile Home
- Office
- Screened-In Porch
- Shed
- Storage
- Tennis Courts
- Walkway
- Workshop
- Office
- Patio
- Porch
- Quonset
- Storage Building
- Tank

8.3.2 Assure that the summation of impervious area on land parcels is numerically accurate.

Summation issues for multiple-story buildings were encountered during the digitization of the 50 largest commercial properties. However, through a sampling of 10 multiple story buildings it was found that only Chase Tower broke the rule that only the ground story is represented in the "Base" value field. This was corrected in the database.

8.3.3 Identify tax exempt properties for which Impervious Area is not accounted for in the PRAD records.

Review of the PRAD appraisal roll indicates that the major classes of tax-exempt land use types (religious organization, school, government) have both building and parking lot improvements recorded. However, after comparing the differences between impervious area values from digitized features to those contained in the appraisal roll for a small sample of these tax-exempt properties, religious organizations and schools were chosen as good candidate land uses for the 200 properties to digitize as part of Subtask 3: supplemental impervious area compilation for up to 200 parcels.

8.3.4 Identify other developed non single-family properties for which no impervious area is accounted for.

Properties which have compacted surfaces used as parking and driving areas do not have these areas accounted for in the PRAD appraisal roll.

8.3.5 Assure that appropriate land use code is assigned to all properties including the "No Use Description" properties with impervious area (~675 records).

The issue of properties that contained impervious area in the appraisal roll but did not contain a land use description was resolved by relying on the Property Use Code (PCA_CD) code as the Land Use indicator rather than the Land Use Description text field that was discovered to be incomplete.

8.3.6 Determine which PRAD accounts are also identified more than once by a larger parcel or tax account to assure no double counting of impervious area.

This issue of separating mobile homes on individual parcels and mobile homes on rented/leased spaces in commercial mobile home parks was encountered during the initial review of the PRAD appraisal roll. This was also resolved by moving to the PCA_CD to determine land use because it contained the distinction between the two types of mobile home conditions, whereas the Land Use Description text field used in the original analysis did not.

8.4 Aerial Photography Digitization

The total impervious area based on appraisal roll values was then compared against planimetrically derived building footprints from orthorectified 1-foot 2010 aerial imagery for a small sample of parcels from specific land uses. This produced a set of two values from which an average percent difference was measured and assumptions about the accuracy of appraisal data tested. An average residential driveway and walkway area was also determined through the digitization of all impervious elements on a random sampling of Single-Family Residential properties throughout the City of Amarillo.

8.4.1 Land Data Accuracy

To assess the accuracy of the appraisal roll data, a sample of properties from varying land use categories was chosen to digitize the footprint of the improvements on each parcel that represent impervious area.

Table 8-2: Accuracy Analysis Summary

	Average Percent Difference (Individual)	Average Percent Difference (Aggregate)
Single Family Homes	17%	17%
Commercial Properties	9%	8%
Churches	27%	31%
Schools	24%	29%

There are land use classes for which the appraisal roll data does not adequately account for the actual impervious area on the land parcel as determined through the aerial photography impervious area footprint digitization exercise. As such, recommendations for the level of reliance on the appraisal roll for impervious area values differ by land use class as follows:

- **Single-Family Residential** – Two hundred (200) Single-Family Home properties were randomly selected from the appraisal roll based on a representative geographic distribution throughout the city. The appraisal roll values are of sufficient quality for establishing the ERU value and the determination of the single-family customer tiers. The 17% difference between the digitized impervious area house footprints and the appraisal roll values can be explained by the difference between the building roof drip-line, which is measured from aerial photography, and the interior living space, which is measured by the PRAD appraisal district. The appraisal roll does not include information on driveway/walkway impervious area so these values were supplemented as discussed in section 8.4.2 below.

- **Non-Residential Properties (except Tax-Exempt)** – For the non-residential class, the 50 largest properties were pulled and digitized. Based on the 8% aggregate overall negative difference between appraisal and digitized values coupled with the 29% standard deviation value indicating wide variation within the distribution, approximately 8,270 developed non-residential properties require parcel specific evaluation prior to first billing. This wide variation in the distribution can be explained by differences in values of up to 59% in either direction. In other words, the digitized value can be as high as 59% above or below the appraisal roll value. The amount of effort to digitize all non-residential properties within the City limits of Amarillo could be reduced if the accuracy of the data is found to be more reliable based on year built. Because compacted gravel parking surfaces are unaccounted for and the significant deviation of digitized values from appraisal values for some land parcels, the City would forego considerable utility revenue relying exclusively on the values listed in the PRAD appraisal roll. The names of the property owners and the specific impervious area values from this exercise are in **Appendix 8B** to this section.

- **Tax-Exempt Properties** – To evaluate the accuracy of the impervious area values of tax-exempt properties contained in the appraisal roll, 200 properties were selected from the religious and school district land use classes. All properties from the tax-exempt land use class that have not been evaluated by this effort require parcel specific evaluation due the considerable difference between digitized values and appraisal roll values. Religious Organization properties were found to have an aggregate average 31% difference from measured values and School District properties were found to have an aggregate 29% difference.

8.4.2 Driveway/ Walkway Area Determination

The PRAD appraisal roll does not account for driveways or walkways on Single Family dwellings including Mobile Homes, Condos, and Duplexes. The same random sampling of Single-Family properties used for accuracy evaluation of house foot print area was used for this determination. The average impervious area attributed to driveways and walkways on single-family residential properties was determined to be 698 ft^2. This value was added to the appraisal roll house footprint value to estimate the total impervious area for each individual property in the single-family class.

8.5 Supplemental Data Collection Needs

There are three major categories of properties that require further evaluation to produce a complete customer billing data set prior to utility billing initiation:

8.5.1 Non-residential and tax-exempt properties that contain impervious area and are not fully accounted for in the PRAD records.

The appraisal roll values for asphalt and concrete paved area were found to diverge from aerial-based measurements by as much as 59% percent on some properties. Additionally, there are no records for compacted surfaces used for parking and vehicular access. As part of the commercial data accuracy evaluation, several properties with compacted surfaces, clearly shown from aerials as used for parking, were found not to have an associated parking area value in the appraisal records. Since the appraisal roll only carries extra feature descriptions of “asphalt” and “concrete” to denote parking areas, this outcome is consistent with expectations. If the City desires to initiate the Drainage Utility with more accurate user-fee assignment values for each property, all non-residential properties with impervious area (5,397 parcels) should be

evaluated on a case by case basis prior to first billing. As an alternative, the City could use the appraisal roll values for initial billing and update values over time.

8.5.2 Properties that contain impervious area values in the PRAD appraisal roll but do not have a billing system match. There are three primary reasons these properties have impervious area but do not have a match in the billing system.

- The property currently does not receive utility services from the city and therefore does not have a billing system account. This could be due to the property being currently uninhabited or simply “off-grid” of any municipal utility services.
- The billing system tax account number applies to only one of the many parcel accounts that can be attributed to a single customer.
- No tax account id in the billing system.

8.5.3 Properties in the billing system that do not have a match in the PRAD appraisal roll with which to assign impervious area.

These properties currently have a utility account with the City but do not have a recorded impervious area or match to a tax account in the appraisal district. This could be due to data entry errors as well as simple oversight by the appraisal district in filling in form data for the property. Also, the Billing System file was delivered to EC on April 20, 2011, so anything entered into the system since this date will not have been assigned an impervious area value from the PRAD appraisal roll.

- The tax accounts for which there is no impervious area but that contain a land use code.
- Tax account parcels that do not have impervious area listed in the appraisal roll, but contain a land use other than undeveloped, warrant closer investigation.
- The properties within the city limits that were added to the appraisal roll since the retrieval date of the data.
- The PRAD appraisal roll was delivered to EC on February 3, 2011. Any information added by the district since that date will not be reflected in this study.
- Properties that were not identified by the appraisal district as within the city limits of Amarillo based on a tax codes.

This study relied upon tax codes to determine what properties were physically located inside the city limits of Amarillo. This was found to be more accurate than simply relying on a site address since many properties have an address with Amarillo but fall outside the city limits or don't have an address with Amarillo and fall inside the city limits.

Appendix 8A

Property Use Codes

Potter -Randall Appraisal District
7/20/2010
State Use Codes/ Property Use Codes

Code	Land Use	DU Assigned Use
A	**Real Residential Single Family**	
0001	ONE FAMILY RESIDENCE	Single Family
0002	SINGLE FAMILY SPLIT FOR FROZEN TAXES	Single Family
0004	RES USE IMPROV. ONLY ON LEASED LAND	Single Family
0006	CONDOMINIUMS - RESIDENTIAL USE	Condos
0009	T-STAND AND/OR MH W/RESIDENCE	Mobile Home
0010	T-STAND AND/OR MOBILE HOME	Mobile Home
0014	PARTIALLY COMPLETE - RESIDENCE	Single Family
0034	RESIDENTIAL - NEEDS RECHECK	Single Family
0094	PARTIALLY COMPLETE - REAL PROPERTY MH	Mobile Home
B	**Real Residential Multi-Family**	
0003	DUPLEX	Duplex
0005	MULTI-LIVING UNITS (APT. COMPLEX)	Multi-Family
0022	APARTMENT COMPLEX	Multi-Family
0026	COMMERCIAL FROZEN TAX ACCT	Multi-Family
0042	CHDO 100 % Exempt	Multi-Family
0043	CHDO 50 % Exempt	Multi-Family
C	**Real Vacant Platted Lots/Tracts**	
0011	MISC. (LAKEBEDS, COMMON AREAS)	Vacant
0012	SHACKS-TOO LITTLE VAL FOR ANY OTHER	Vacant
0013	SALVAGE VALUE (CONDEMNED PROPERTY)	Vacant
0018	RESIDENTIAL LOTS - UNIMPROVED	Vacant
0019	RESIDENTIAL SMALL TRACTS- UNIMPROVED	Vacant
0024	RES VACANT LAND W/MISC IMPROVEMENTS	Vacant

0029	UNIMPROVED COMMON AREAS	Vacant
0033	COMMERCIAL LOTS - UNIMPROVED	Vacant
0097	VACANT LAND WITH MOBILE HOME	Mobile Home
D1	**Real Qualified AG Land**	
0047	EXMP-ARTICLE 1D1-W/MISC. IMPROVEMENT	Non-Residential
0048	EXEMPT - ARTICLE 1D1 - VACANT LAND	Vacant
0087	WILDLIFE MANAGEMENT-1/MISC. IMPROVEMENT	Non-Residential
0088	WILDLIFE MANAGEMENT-VACANT LAND	Vacant
D2	**Real Non-Qualified AG Land**	
0017	UNIMPROVED AG LAND (NO EXEMPTION)	Vacant
0020	COM LG TRACT (ACR PRICE) UNIMPROVED	Vacant
0049	AG W/MISC. IMPROVEMENTS (NO RES.)	Non-Residential
E	**Real Farm and Ranch Improvements**	
0046	HOMESITE ON AG ACCOUNT	Single-Family
0086	HOMESITE ON WILDLIFE MANAGEMENT	Single-Family
F1	**Real Commercial**	
0008	CONDOMINIUMS - COMMERCIAL USE	Multi-Family
0015	PARTIALLY COMPLETE - COMMERICAL	Non-Residential
0016	COM MISC IMPROVEMENTS(ASPHALT,ETC	Non-Residential
0021	COM PROPERTY WITH IMPROVEMENTS	Non-Residential
0023	COM IMPROVEMENT ONLY ON LEASED LAND	Non-Residential
0025	MOTELS	Non-Residential
0028	IMPROVED COMMON AREAS	Non-Residential
0035	COMMERCIAL - NEEDS RECHECK	Non-Residential
0041	MOBILE HOME PARK	Non-Residential
0044	ASARCO	Non-Residential
F2	**Real Industrial**	
0007	INDUSTRIAL PROP. (MANUFAC, ETC.)	Non-Residential
0027	PARTIALLY COMPLETE - IND. PROPERTY	Non-Residential
0040	ELECTRICAL GENERATION PLANT	Non-Residential
J2	**Utility Gas Distribution**	
0037	ENERGAS	Non-Residential
J3	**Utility Electric Companies**	
0036	S P S (ELECTRIC)	Non-Residential

J4	**Utility Telephone Companies**	
0038	S W B T (TELEPHONE)	Non-Residential
0039	A T & T	Non-Residential
J5	**Utility Railroads**	
0031	BNSF RR - TRACK	Not Applicable
0032	BNSF RR - LAND / BUILDINGS	Non-Residential
J7	**Utility Cable TV**	
0045	CABLE TV	Non-Residential
M1	**Tangible Other Personal, Mobile Homes**	
0095	MOBILE HOMES IN MH PARK	Non-Residential
0098	PARTIALLY COMPLETE - MOBILE HOME	Mobile Home
0099	MOBILE HOMES	Mobile Home
O	**Inventory Property**	
0030	RESIDENTIAL LOTS - INVENTORY	Single Family
S	**Special Inventory**	
0096	MANAFACTURED HOMES - INVENTORY	Mobile Home
X	**Totally Exempt Property**	
0050	CITY (GXX)	City
0051	SCHOOL (PUBLIC) (GXX)	Public School
0052	COUNTY (GXX)	County
0053	STATE OF TEXAS (GXX)	State
0054	U. S. GOVERNMENT (GXX)	Federal
0055	RELIGIOUS ORGANIZATIONS (IXX)	Religious
0056	MISCELLANEOUS (IXX)	Non-Residential
0057	SCHOOL (OTHER) (IXX)	School
0058	PROPERTY TAX SALE (CITY & ST) (GXX)	Non-Residential
0059	CEMETERIES (IXX)	Non-Residential
0060	SOLDIERS PERSONAL PROPERTY (GXX)	Non-Residential
0065	CHARITABLE ORGANIZATION (IXX)	Non-Residential
0067	VETERAN'S ORG. & LAND BOARD (IXX)	Non-Residential
0073	MEDICAL CENTER DEVELOPMENT (IXX)	Non-Residential
0074	HISTORIC SITE (IXX)	Non-Residential
0075	EXEMPT PROPERTY- NEEDS RECHECK	Non-Residential

Appendix 8B

Commercial Properties

Name	Tax Account	Digitized IA	Appraisal IA	Percent Difference
4714 Warehouse	200125013000R	938,116	1,019,584	-9%
7909 AMARILLO LLC	044397005000R	361,941	343,595	5%
Allen Howard	056010030550R	38,544	20,552	47%
Amarillo Civic Center	031050026920R	848,301	736,404	13%
Amarillo Medical Center	001075002000R	2,664,934	1,859,929	30%
Arthur Richard	056010016440R	5,803	5,725	1%
AUTOPLEX REALTY LP	086342047000R	342,045	383,310	-12%
Bell Plaza	022600005000R	681,656	672,132	1%
Bellsroe	073050035700R	344,349	398,359	-16%
BNSF	044620000250R	3,014,160	2,351,221	22%
Boston & Mays LLC	090085010000R	625,296	648,868	-4%
BRADLEY TEXAS REALTY LP	001027000500R	318,720	345,902	-9%
Briggs Sandra Park	039030038550R	12,281	3,740	70%
Bruckner Truck Sales	022660000100R	747,806	850,493	-14%
Burger King	082085000010R	692,236	648,410	6%
CFJ PLAZA COMPANY III LLC	001028023000R	518,457	365,231	30%
Chapman G R Limited	001081000010R	1,263,706	1,693,203	-34%
Chase Tower	031050039500R	87,841	112,093	-28%
Community Center	086143501000R	624,459	614,854	2%
Doan Dale	056010015490R	11,702	1,639	86%
Fields Rodney Wayne	056010016430R	16,780	14,832	12%
Hand Nathan T	039030039750R	24,347	6,250	74%
Home Depot	044460021750R	475,238	501,586	-6%
Home for the Elderly	031050079800R	466,308	737,694	-58%
Iron Skillet	044001015000R	875,340	850,493	3%
JAGI	073021005000R	209,587	229,385	-9%
JJRE	056010029810R	60,425	19,775	67%
Johnson Charles	048040017500R	399,893	417,144	-4%
Kirk Justin	056010015550R	33,186	6,650	80%
Lowes	044752200010R	659,529	584,882	11%
Lowes Home Centers	065162045670R	589,767	520,585	12%
Madison Family	061120089200R	302,341	271,409	10%
Office Depot	090070057500R	451,321	412,716	9%
Panhandle Container Service	048040065350R	245,351	241,819	1%
Potter County	200138000010R	4,251,348	2,687,170	37%
PTCAA TEXAS LP	042980020600R	473,671	387,833	18%
Puckett Dunhill	065157042000R	617,557	615,827	0%
Quest Diagnostics	073053040550R	478,071	467,423	2%
R & I Paint Supply	200226050100R	25,982	27,219	-5%
Sam's Club	001027003100R	560,588	576,066	-3%
Sears	073021000010R	1,864,704	1,599,516	14%
Sears II	073021012000R	119,692	103,561	13%
Sears Panhandle Retirement	044750030000R	749,056	495,584	34%
Southwest Premier	044924020000R	456,553	528,533	-16%
STATE DEPT HIGHWAYS &	200229040000R	805,901	368,564	54%
The Colonies at Hillside	009168307000R	525,727	543,243	-3%
The Home Depot	086158300010R	467,709	744,668	-59%
Veterans Hospital	001075012050R	844,444	526,970	38%
Walmart	022620000700R	780,831	737,485	6%
Walmart II	022030051500R	874,368	1,037,380	-19%
Walmart III	065162045300R	823,361	981,151	-19%
Walmart IV	086073000010R	863,253	779,126	10%
Western Marketing Services	039030035050R	126,947	87,102	31%
WESTGATE CHEVROLET LTD	005754016500R	337,116	375,587	-11%
WESTGATE MALL	086158000250R	3,361,444	3,614,373	-8%
WESTGATE PLAZA	086158311000R	453,257	463,358	-2%
WESTGATE PLAZA II	086158311500R	502,499	492,130	2%
WILMINGTON TRUST COMPANY	005754004650R	392,930	369,151	6%
WP WBP	073181070400R	1,240,775	1,096,310	12%

Task 9 Equivalent Residential Unit Evaluation/ Rate Structure Recommendations/Billing Rate-Revenue Estimates

The proposed utility rate structure is land-parcel impervious area based and employs an equivalent residential unit (ERU) user-fee assignment standard.

9.1 Use of Impervious Area to Assign Utility User-fees

Impervious area (building footprint, driveways/walkways and parking areas) on property parcels has been the preferred Drainage Utility user-fee assignment method for the majority of Texas drainage utilities and for drainage utilities throughout the United States. The rationale for an impervious area parameter is simple. Replacing natural ground cover with impervious coverage results in more runoff volume and higher peak flow rates during storm events and increased pollutant discharge to receiving waters. Those impacts in turn translate into capital project, operating, and administrative costs borne by the drainage management program and funded by the utility service user-fee. The relationship between impervious area and stormwater runoff is direct, proportional, and well documented. Thus, impervious area is an appropriate surrogate for measuring runoff volume, peak rate of flow, and pollutant content of runoff and is consistent with the cost of providing services and drainage facilities.

9.2 Equivalent Residential Unit

Impervious area based equivalent residential billing unit (ERU) standards are widely used to assign utility user-fees. The ERU is defined as the average impervious area associated with single-family properties. For Amarillo, the average impervious area value for single-family houses is 2761 square feet. Because the PRAD data values are not accurate to the one square foot level, the average value is rounded to the nearest 100 square feet for use as the *ERU value, 2,800 square feet*. The use of the ERU allows simplification of the assignment of utility user-fees to residential properties and it serves as the service unit measure to normalize assignment of user-fees to non-residential properties (i.e., commercial, industrial, institutional properties). This is the recommended billing unit standard to be applied to commercial, industrial, civic, religious organization and multi-family land uses.

9.2.1 Single-Family Residential Properties

Based on examination of the distribution of parcel-specific impervious area, a three-tiered rate structure is recommended for single-family properties with ERU based parcel specific assignment of utility user-fees to commercial, industrial, and institutional properties. Figure 9.1 presents the distribution of parcel specific impervious area values for single-family properties. Tiers are based on quartile evaluation. The central 50 percent of properties was used to define the impervious area value limits for the "Typical" property classification- 2,072 to 3,237 square feet. The lower 25 percent of properties are defined as the "Small" classification, which applies to properties with less than 2,072 square feet impervious area. The highest 25 percent of properties was used to define the "Large" classification, which applies to properties with greater than 3,237 square feet impervious area. Table 9.1 summarizes this information below.

Table 9-1: Single-Family Residential Tiers

Tier	Range	ERUs	Total Parcels	Average IA (SqFt)	Total ERUs
Tier 1	< 2,072	0.68	15,920	1,783	10,826
Tier 2	2,072 ≤ X < 3,237	1.00	28,551	2,638	28,551
Tier 3	≥ 3,237	1.51	14,307	3,979	21,604

ERU Value: 2,800 square feet Impervious Area (IA)

Single-Family: Three Tiered

- Tier 1: "Small" 0.68 ERU, <2,072 square feet IA
- Tier 2: "Typical" 1.0 ERU, 2,073-3,237 square feet IA
- Tier 3: "Large" 1.51 ERU, >3,238 square feet IA

Table 8.1 includes the number of ERUs associated with each land use classification for the single-family tiers. Since the average impervious area value for mobile homes, condominiums and duplex dwelling units is similar to the value for "small" single-family houses, they are assigned 0.68 ERU per dwelling unit.

9.2.2 Non-Residential-Commercial/Industrial/Institutional Properties

Non-residential properties are evaluated for billing unit assignment on a case-by-case basis due to their highly variable impervious area. Based on the evaluation of impervious area for single-family land parcels, the equivalent residential unit (ERU) value (impervious area associated with the average single-family parcel) is 2,800 square feet. This is the billing unit standard for commercial, industrial, and institutional land uses.

Total ERUs/Land Parcel = Parcel Impervious Area/2,800 sq. ft

As an example, one acre (43,560 square feet) of impervious area is equivalent to 15.6 ERUs

9.3 Revenue Projections

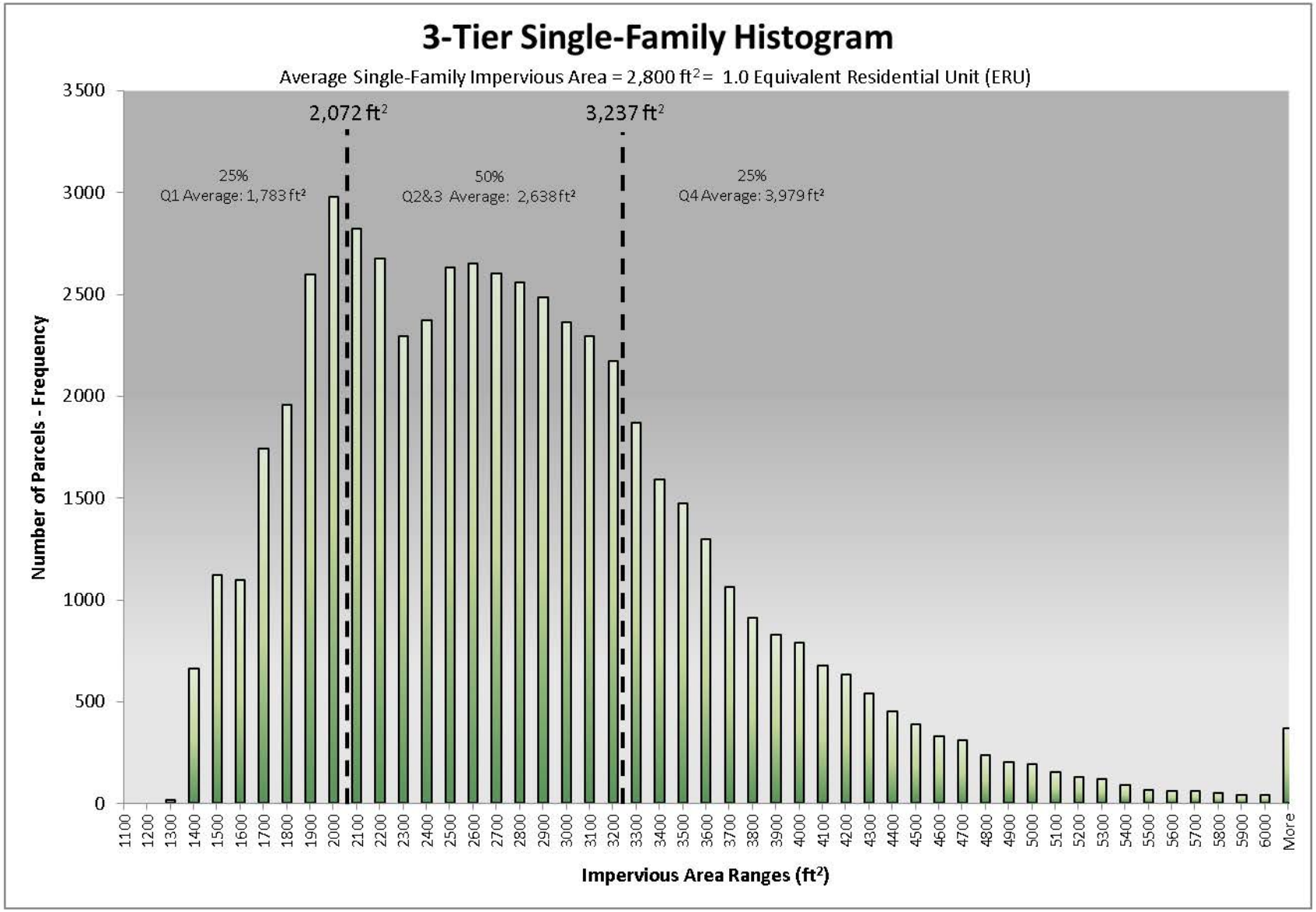
Based on the appraisal roll land-data analysis summarized in Table 8.1, the total number of ERUs in the City of Amarillo is 142,572. This includes all developed properties with the exception of the statutorily exempt properties. All discretionary exempt properties are included in this ERU count.

Annual Revenue Estimate = (142,572 ERU) x (12 month/ year/) x ($/ month/ ERU)

- $3/ month/ ERU = $5,100,00/ year
- $4/ month/ ERU = $6,800,00/ year
- $5/ month/ ERU = $8,500,000/ year

Since the land data evaluation revealed that the appraisal roll data does not account for significant impervious area for some tax-exempt and commercial class properties, actual revenue will increase as impervious area values are verified for these properties prior to first billing. Based on the aggregate impervious area shortfall identified during the land data evaluation, it is estimated that *actual revenue could be up to 6 percent higher than these estimates.*

Figure 9-1: Single-Family Residential Histogram



Task 10 Exemptions Evaluation

The Texas Local Government Code Chapter 552 C specifies two classes of property exemptions from the Drainage Utility user-fee: mandatory and discretionary. Mandatory exemptions *must* be allowed. Discretionary exemptions *may* be allowed by the City. Exemptions are specified in the Drainage Utility user-fee ordinance.

10.1 Mandatory Exemptions

- Undeveloped Land (no building improvements or other impervious coverage on the land parcel)
- State Property
- Public and Private Institutions of Higher Education
- Property with a Privately Owned and Maintained Drainage System- A private drainage system is defined in the Texas Local Government Code as one that does not discharge into any natural or manmade waterway or drainage infrastructure within the City limits including public streets, drainage easements, inlets, storm sewers, manholes, junction boxes, ditches, swales, channels, or creeks. An example would be a property sited on the City's municipal boundary and for which run-off, by topography, flows directly out of the municipal limits and does not reenter any portion the City's drainage system.

10.2 Discretionary Exemptions (City Policy Decision)

- City Property
- County Property
- School District Property
- Religious Organization Property

In considering discretionary exemptions from the Drainage Utility user-fee, it is recommended that the City of Amarillo consider the following factors:

- Does the City provide other municipal utility services to this property-class free of charge or at a special rate-i.e., water, wastewater or solid waste?
- What is the lost revenue associated with allowing an exemption? Any lost revenue must be subsidized by the remaining utility customers.
- The more discretionary exemptions allowed could influence public perception on the Drainage Utility user-fee –is it a "user-fee" or a "tax"?

- It is recommended that the City pay the user-fee on City property to set leadership example.

The 2008 Espey Consultants survey of Texas Drainage Utilities indicates that of the 18 cities with population greater than 100,000 that have drainage utilities, five (28%) exempt school districts and one (6%) exempts religious organizations.

10.3 Other Property Classes of Interest

Federal facilities are not exempt from the Drainage Utility user-fee. This was clarified by the passage of Federal legislation in January 2011 (S.3481).

Lands classified as agricultural for taxation purposes that contain development improvements such as building structures are not exempt from the Drainage Utility user-fee.

10.4 User-fee/Revenue Impacts of Exemptions

Using the PRAD land data based ERU summaries by land use type presented in Table 8.1, the customer rate increases associated with allowing each of the discretionary exemptions are estimated as follows:

Table 10-1: Discretionary Exemptions-Utility Rate Impacts

	PRAD	Extrapolated Values
School District	+2.5%	+3.2%
Religious Organization	+3.2%	+4.2%
County	+0.8%	+1.0%
City	+2.0%	+2.6%

The extrapolated values are based on the aggregate percent difference between PRAD impervious area values and values determined by aerial photography digitization in Task 8, which was +30 percent for tax-exempt properties (i.e., the PRAD values are, on average, lower than photographic based measurements.)

If any discretionary exemptions are allowed, monthly user-fees would need to increase for the remaining customers in order to produce the same level of revenue. If exemptions are allowed, the non-exempted residential and commercial customers will be subsidizing the exempted customers. On the other hand, if customer billing rates are held constant as exemptions are allowed, utility revenue is reduced. For example,

exemptions of school districts would require a user-fee increase of approximately 2.5% to residential and commercial customers to generate equivalent utility revenue.

For comparison reference, the statutorily exempt properties comprise the following percentages of the utility rate base:

- State Property- 0.5%
- Public and Private Institutions of Higher Education-0.5%

10.5 Phasing In User-fees

For the discretionary exemption class properties, the City can consider phasing in user-fees over a 2-3 year period to ease budgetary impact.

Task 11 Project Recommendations and Prioritization-25 Year Period

The work elements of this task were accomplished within Task 2, 3 and 12.

Task 12 Financial Analysis of Drainage Utility System

Based on the report on Drainage Maintenance Practices (Task 2), Review of Storm Water Management Master Plan (Task 3), the Drainage Utility Needs Assessment Summary Report (Task 5), and the preliminary Land Data Review and Equivalent Residential Unit determination (Tasks 8 & 9), a baseline budget was developed for the Drainage Utility and with estimates of the customer user-fees required to provide sufficient revenue to meet the estimated financial needs for the first five (5) years of operation. This section discusses the baseline budget, the estimated Drainage Utility user-fees, and the key drivers (i.e., assumptions) that impact these estimates.

It should be noted that this analysis is a planning level exercise which relies heavily on assumptions. To the extent the assumptions contained herein are not reflective of historical, actual, or intended practices; further revision of this analysis may be needed. **To the extent that the assumptions utilized in the analysis are revised, the customer user- fees indicated herein may need to be revised higher or lower**.

Summary of Estimated Drainage Utility Budget, Estimated User-Fees, and Service Level

Table 12-1 below presents a summary of the baseline budget for the Drainage Utility. To support this level of expenditure, the Drainage Utility customer user- fees outlined in Table 12-2 below are estimated to be required. Please note that the user-fees presented in Table 12-2 assume that no discretionary exemptions for the drainage user-fee are approved by the City Commission.

Table 12-1: Baseline Drainage Utility Budget

	Year 1	Year 2	Year 3	Year 4	Year 5
Operation and Maintenance	$ 1,931,821	$ 2,251,900	$ 2,655,804	$ 2,801,435	$ 2,984,405
Debt Service / Cash Capital	1,618,575	1,458,191	1,428,775	1,133,748	1,169,872
Transfers	102,626	104,678	106,772	108,907	111,085
Reserve Fund Contributions	889,326	727,578	350,998	498,257	276,985
Total Expenditures	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348

Table 12-2: Estimated Drainage Utility User-Fees

	Year 1	Year 2	Year 3	Year 4	Year 5
Residential (Per Dwelling)					
Tier 1-Small	$ 1.71	$ 1.71	$ 1.71	$ 1.71	$ 1.71
Tier 2-Typical	2.51	2.51	2.51	2.51	2.51
Tier 3-Large	3.79	3.79	3.79	3.79	3.79
Non-Residential (per ERU [1]	2.51	2.51	2.51	2.51	2.51

[2] ERU= 2,800 square feet impervious area

The baseline budget and user- fees presented above are estimated to support the following Drainage Utility program for the first five (5) years of operation:

- Transfer of nine existing personnel from General Fund departments to the Drainage Utility and addition of 21 additional positions over the first five years of operation (see Attachment B for listing of personnel)
- Equipment purchase and related municipal garage costs (See **Appendix 12C** to this section for Equipment Listing)
- $500,000 in Contractual Services support on an annual basis
- Additional budgeted costs of approximately $650,000 - $700,000 a year for other supplies, contractual services, and other miscellaneous charges
- Debt issue (20-year term, Interest Rate of 5.0%) of approximately $12 million in Year 1 to provide funds for four (4) capital projects
- Indirect Cost support to the City's General Fund
- Maintenance of a 90-day Operations and Maintenance Reserve Fund
- 5-year build-up of a Capital Repair, Replacement, and New Development Reserve Fund of approximately $2 million
- Contributions to Employee Leave Payable Reserve Fund of 0.50% of total salaries and wages annually
- Debt Service Reserve Fund equivalent to one (1) times annual maximum outstanding debt service
- Maintenance of a 1.35x debt service coverage level (assumes all expenditures other than O&M are discretionary)

Appendix 12A to this section presents a more detailed presentation of the preliminary, baseline budget and estimated performance of the Drainage Utility Fund. The remainder of this section discusses the assumptions and details behind the cost development for each major cost component included within the budget

12.1 Personnel Costs

The following assumptions have been made in developing the estimated personnel costs:

- 2% average annual increase in base hourly wage rates;
- Medicare expense of 1.45% of total salaries and wages;
- Social Security expense of 6.20% of total salaries and wages;
- Workers Compensation expense of 2.00% of total salaries and wages;
- Texas Municipal Retirement System ("TMRS") expense of 14.09% of total salaries and wages;
- Unemployment expense of 0.54% of up to $9,000 of salaries and wages;
- Life Insurance cost of $12.00 per employee per year;
- Health Insurance cost of $616.00 per employee, per month, escalating at an annual rate of 2.00%
- All employees are assumed to work 2,080 hours per year;
- No clothing or car allowances have been included; and
- All employees are assumed eligible for participation in health, life, and TMRS benefit programs.

Table 12-3 below illustrates the proposed staffing plan for the first five years of Drainage Utility operation and includes the employee description, group, class, and assumed base hourly wage rate for each employee. Also presented are the number of FTEs in Years 1 and 5.

Table 12-3: Proposed Staffing Plan for Drainage Utility (Years 1 – 5)

Description	Group	Class	Base Hourly Rate	FTEs by Year				
				Year 1	Year 2	Year 3	Year 4	Year 5
Supervisor	C-14	MGT220	$ 16.98	1	1	1	1	1
Foreman II	C-10	MGT222	13.92	2	2	3	3	3
Equipment Operator	C-09	TRD220	13.17	1	1	1	1	1
Roll-off Operator	C-08	TRD951	12.30	0	1	1	1	1
Operator	C-07	TRD960	11.75	0	1	2	3	4
Sweeper Operator	C-06	TRD950	11.22	5	5	5	5	5
Concrete Finisher	C-06	TRD222	11.22	2	2	2	2	2
Equipment Operator	C-05	TRD221	10.70	1	1	3	3	3
Worker	C-04	TRD930	10.24	4	7	9	9	10
Total				16	21	27	28	30

Based on the above assumptions, **Appendix 12B** to this section presents the estimated line-item personnel budget for the Drainage Utility for years 1 through 5.

12.2 Equipment Purchase and Maintenance Costs

As outlined in the Task 2 section of this report concerning Drainage Maintenance Practices in addition to the personnel outlined above, the Drainage Utility will also require additional equipment to enable the work crews to perform essential maintenance functions. Equipment utilized by City crews is currently maintained by the City's Municipal Garage with the department requesting the piece of equipment being responsible for funding the initial equipment purchase, and then a monthly rental rate is paid to cover equipment operation, maintenance, and eventual replacement.

To develop the costs associated with equipment for the Drainage Utility, initial purchase price estimates provided by the City as well as a spreadsheet produced by the City's Municipal Garage outlining equipment replacement cost and monthly rental rates were utilized. To reflect the impact of inflation on the purchase price of future equipment purchases, an annual escalation rate of 2.0% was assumed.

To estimate the monthly rental rates charged by the Municipal Garage, the spreadsheet provided by the Garage was also used to estimate the monthly rental rates for each piece of equipment. For the monthly rental rates, an annual escalation factor of 3.0% was used to estimate future costs.

Within the analysis, it was assumed that street sweeping operations would be transferred to the Drainage Utility along with a Hydroscopic Excavator and a number of

support trucks. Since this equipment has already been purchased, only the operating cost (i.e., monthly rental rate) for this activity was included within the budget for the Drainage Utility.

Appendix 12C to this section presents the planned equipment purchases and provides purchase price and operating costs estimates. It should be noted that given the limited useful life of the equipment in question, all equipment purchases are assumed to be funded through cash capital outlays.

12.3 Other Operations and Maintenance Costs

The City's Street Department has historically been tasked with performing drainage-related work. Therefore, historical work orders for the Street Department for Fiscal Years ("FY") 2008, 2009, and 2010 were analyzed to segregate drainage management related costs. Based on this analysis, it was determined that approximately 16% of the Street Department's budget was related to the operation and maintenance of the City's drainage system.

To estimate the additional budgeted costs of the Drainage Utility related to Supplies, Contractual Services, and Other Charges, it was assumed that approximately 16% of the Street Department's FY 2011 budget, with the exception of costs related to R&M Improvements, would reflect the line-item operating budget for the Drainage Utility in Year 1. These costs were then escalated annually at a fixed rate of 2.0% over the planning period.

It was further assumed that R&M Improvements for the Drainage Utility would reflect the Utility's use of outside contractors for repairs which the City's crews were unable to perform due to other commitments and/or operational limitations. Given this fact, and for an initial starting point, an annual budget of $500,000 was assumed for this line-item, escalating at an annual fixed rate of 2.0% for the planning period.

Appendix 12D to this section presents the estimated line-item budget for Operations and Maintenance expenses other than personnel and equipment.

12.4 Capital Outlay / Debt Service

To begin funding needed Drainage Utility capital improvements, the City specified funding an initial debt issuance of approximately $12 million in Year 1 of the Utility's creation. Projects were selected in priority order as provided by the City (Task 3,

Tables 3-1 & 3-2). With these funds, it is estimated that the utility will be able to fund the capital improvements outlined in Table 12-4 below:

Table 12-4: Capital Improvement Projects funded by First Drainage Utility Debt Issue

Project Number	Project Description	Estimated Cost
P15-CA	Catallpa/Farmers/Western	$ 6,720,000
P15-HH	Hillside/Hampton/SW 51st/Western	2,148,000
P6-FW	Fleetwood/Terrace/Teckla/Fulton	1,848,000
410226	Olsen Storm Sewer Ext / S Western St to Lawrence Lake	504,000
	Total	$ 11,220,000

To project the debt service associated with these issuances, a 20-year term at 5.0% interest with level annual payments was assumed. For equipment purchases not funded with debt, additional cash expenditures have been included within the budget to provide the necessary funds. Table 12- 5 below presents the total debt service and cash capital outlays estimated during the first five (5) years of operation.

Table 12-5: Estimated Debt Service / Cash Capital Outlays

	Year 1	Year 2	Year 3	Year 4	Year 5
Debt Service	$ 978,575	$ 978,281	$ 978,281	$ 978,281	$ 978,281
Cash Capital Outlays	640,000	479,910	450,493	155,467	191,590
Total Capital	$ 1,618,575	$ 1,458,191	$ 1,428,775	$ 1,133,748	$ 1,169,872

Given that the debt issuance by the Drainage Utility might be in the form of revenue bonds, it was assumed that any debt issues would carry a debt service coverage requirement. Conversations with City staff have indicated that for purposes of this analysis, a 1.35x debt service coverage level should be assumed. Assuming that all Drainage Utility expenditures other than operations and maintenance expenses are discretionary, the user-fees identified in Table 2 above are estimated to produce sufficient revenue to meet this threshold during the first five (5) years of operation.

12.5 Transfers

As discussed earlier, the City's Street Department currently holds responsibility for drainage-related operation and maintenance activities. Within the Department's budget, payments are made to the City's General Fund to reflect indirect services provided to the department by the City's centralized service functions (i.e., human resources, finance, information technology, etc.). It was assumed that the Drainage

Utility would also be responsible for the payment of some level of indirect costs once established. To estimate the level of indirect costs, a review was conducted of indirect cost responsibility of the City's Street Department as identified within the City's indirect cost allocation for September 2010. For purposes of this analysis, it was assumed that the Drainage Utility would be responsible for approximately 30% of the identified indirect costs. Please note that, at this time, payments have not been included for services provided by the City's Street, Water and Wastewater, and/or Engineering departments.

12.6 Reserve Funds

The City specified that four (4) reserve funds would need to be maintained by the Drainage Utility. These include (1) an Operation and Maintenance ("O&M") Reserve Fund, (2) a Capital Repair, Replacement, and New Development Reserve Fund, (3) an Employee Leave Payable Fund, and (4) a Debt Service Reserve Fund. These funds are discussed in more detail below. Within this analysis, it was assumed that all interest earned on reserve funds would accrue to the specific fund and not be used as an offset to any other cost related to the Drainage Utility with the exception of the debt service reserve. Within this reserve fund, any interest accrued is utilized to pay annual debt service costs.

For this analysis, an interest rate of 0.06% has been utilized to correspond to the current rate of return from TexPool. Further, for purposes of calculating debt service coverage, it is assumed that all revenues that are used as contributions to reserve funds are discretionary and can be used for debt service should the need arise.

12.7 Operation and Maintenance ("O&M") Reserve Fund

The City's current financial policies require a 90-day O&M reserve fund. Contributions to meet this requirement have been included within the preliminary, baseline budget numbers. This reserve fund is fully funded in Year 1 with additional contributions made annually as necessary to ensure the 90-day reserve level is maintained.

12.8 Capital Repair, Replacement, and New Development Reserve Fund

Assuming Drainage Utility assets have a service life of 50 years, it would be necessary to fund and replace, on average, approximately 2% of the Drainage Utility's assets annually. While the immediate funding of such a replacement program is not feasible

on initial establishment of the Drainage Utility, it is important that the Utility begin setting funds aside now to assist with needed future asset replacement and significant repair costs that may arise on an emergency basis. In addition, the City desires to set aside funds to support the design and construction of off-site drainage projects required by new land development activity.

For purposes of this analysis, an initial funding level for the reserve fund was assumed that allows the fund to accumulate approximately $2 million by the end of the fifth year of operation, assuming that no monies are drawn from the fund over this time period.

12.9 Employee Leave Payable Reserve Fund

Based on conversations with City staff, it has been requested that the Utility also set aside funds to pay for accrued employee leave. For purposes of this analysis, it was assumed that annual contributions to this fund would be made equal to 0.5% of salaries and wages.

12.10 Debt Service Reserve Fund

In order to ensure that all potential bond covenants are adhered to, a debt service reserve fund was established equivalent to one (1) times the outstanding, maximum level of annual debt service. The City specified that monies for the reserve fund will be drawn from debt proceeds. To accommodate this, an iterative calculation process was applied to increase the planned debt issuance in Year 1 to ensure that sufficient monies would be available to fund the required debt service reserve.

Table 12-6 below presents the annual contributions to the above reserve funds for the first five (5) years of operation.

Table 12-6: Estimated Reserve Fund Contributions

	Year 1	Year 2	Year 3	Year 4	Year 5
O&M Reserve	$ 476,197	$ 78,614	$ 99,230	$ 35,505	$ 44,688
Capital R&R	411,172	646,386	248,408	459,195	228,422
Employee Leave Payable	1,957	2,577	3,360	3,557	3,875
Debt Service Reserve [(1)]	0	0	0	0	0
Total Expenditures	$ 889,326	$ 727,578	$ 350,998	$ 498,257	$ 276,985

[(1)] Debt Service Reserve funded via debt proceeds

12.11 Estimated General Fund Impact

As discussed above, once established the Drainage Utility will be financially responsible for select existing personnel and for equipment to support these work crews. Given this

transfer of personnel and equipment, the City's General Fund departments will see a reduction in costs. However, it is anticipated at this time that the City will not be exempted from the payment of drainage user-fee and, as such, any cost reductions experienced by the General Fund from the transfer of personnel and equipment must be offset by these new user-fee.

At the City's request and as a component of Task 12, a quantification of the estimated net financial impact of the establishment of the Drainage Utility on the General Fund was developed. A memorandum summarizing findings is provided in **Appendix 12E** to this section.

12.12 Enterprise Fund Budget Model

The multi-year, enterprise fund budget model developed for the Drainage Utility financial evaluation presented in this section is included in the **Data Appendix**. The model is in Microsoft Excel format, and includes documentation and user guidance.

Appendix 12A

Baseline Budget

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
FINANCIAL SUMMARY

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Model Calculated Fees					
Residential (Per Dwelling)					
Tier 1	$ 1.71	$ 1.71	$ 1.71	$ 1.71	$ 1.71
Tier 2	2.51	2.51	2.51	2.51	2.51
Tier 3	3.79	3.79	3.79	3.79	3.79
Non-Residential (Per ERU)	2.51	2.51	2.51	2.51	2.51
BEGINNING FUND BALANCE					
Restricted for O&M Reserve	$ -	$ 476,340	$ 555,263	$ 654,856	$ 690,765
Restricted for Capital Repair and Replacement	-	411,295	1,058,122	1,307,240	1,767,358
Restricted for Employee Leave Payable	-	1,958	4,537	7,901	11,463
Restricted for Debt Service Reserve	-	978,869	978,869	978,869	978,869
Unrestricted	-	-	-	-	-
Total Beginning Fund Balance	$ -	$ 1,868,461	$ 2,596,791	$ 2,948,865	$ 3,448,454
REVENUES:					
Charges for Services	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348
Other Revenues	-	-	-	-	-
Interest on Unrestricted Fund Balance	-	-	-	-	-
Total Revenues	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348
Use of Unrestricted Fund Balance	-	-	-	-	-
Total Sources of Funds	**$ 4,542,348**	**$ 4,542,348**	**$ 4,542,348**	**$ 4,542,348**	**$ 4,542,348**
EXPENDITURES:					
Operations and Maintenance (O&M)					
Personnel Services	$ 603,606	$ 797,447	$ 1,040,762	$ 1,101,543	$ 1,200,927
Supplies	133,663	136,337	139,063	141,845	144,682
Contractual Services	517,170	527,513	538,064	548,825	559,801
Equipment Rental (Municipal Garage)	668,880	781,931	929,068	1,000,199	1,069,792
Other Charges	8,502	8,672	8,846	9,023	9,203
O&M Subtotal	$ 1,931,821	$ 2,251,900	$ 2,655,804	$ 2,801,435	$ 2,984,405
Capital Outlay:					
Existing Debt Service	$ -	$ -	$ -	$ -	$ -
Projected New Debt Service	978,575	978,281	978,281	978,281	978,281
Cash Capital Outlays	640,000	479,910	450,493	155,467	191,590
Capital Outlay Subtotal	$ 1,618,575	$ 1,458,191	$ 1,428,775	$ 1,133,748	$ 1,169,872

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
FINANCIAL SUMMARY

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Model Calculated Fees					
Residential (Per Dwelling)					
Tier 1	$ 1.71	$ 1.71	$ 1.71	$ 1.71	$ 1.71
Tier 2	2.51	2.51	2.51	2.51	2.51
Tier 3	3.79	3.79	3.79	3.79	3.79
Non-Residential (Per ERU)	2.51	2.51	2.51	2.51	2.51
Transfers In / (Out):					
Indirect Costs (General Fund and Public Works Administration)	$ 102,626	$ 104,678	$ 106,772	$ 108,907	$ 111,085
1410 Engineering	-	-	-	-	-
1420 Streets	-	-	-	-	-
5200 Water and Sewer	-	-	-	-	-
Transfers Subtotal	$ 102,626	$ 104,678	$ 106,772	$ 108,907	$ 111,085
Income / (Loss) Before Reserve Fund Contributions	$ 889,326	$ 727,578	$ 350,998	$ 498,257	$ 276,985
Reserve Fund Contributions:					
O&M Reserve	$ 476,197	$ 78,614	$ 99,230	$ 35,505	$ 44,688
Capital Repair, Replacement, New Development Reserve	411,172	646,386	248,408	459,195	228,422
Employee Leave Payable	1,957	2,577	3,360	3,557	3,875
Debt Service Reserve (Funded from Debt Proceeds)					
Reserves Subtotal	$ 889,326	$ 727,578	$ 350,998	$ 498,257	$ 276,985
Total Use of Funds	**$ 4,542,348**	**$ 4,542,348**	**$ 4,542,348**	**$ 4,542,348**	**$ 4,542,348**
Additional Funds Required for Debt Service Coverage	$ -	$ -	$ -	$ -	$ -
Operating Income / (Loss)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
ENDING FUND BALANCE					
Restricted for O&M Reserve	$ 476,340	$ 555,263	$ 654,856	$ 690,765	$ 735,881
Restricted for Capital Repair, Replacement, New Development Reserve	411,295	1,058,122	1,307,240	1,767,358	1,996,909
Restricted for Employee Leave Payable	1,958	4,537	7,901	11,463	15,346
Restricted for Debt Service Reserve	978,869	978,869	978,869	978,869	978,869
Unrestricted	-	-	-	-	-
Subtotal	$ 1,868,461	$ 2,596,791	$ 2,948,865	$ 3,448,454	$ 3,727,005

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
FINANCIAL SUMMARY

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Model Calculated Fees					
Residential (Per Dwelling)					
Tier 1	$ 1.71	$ 1.71	$ 1.71	$ 1.71	$ 1.71
Tier 2	2.51	2.51	2.51	2.51	2.51
Tier 3	3.79	3.79	3.79	3.79	3.79
Non-Residential (Per ERU)	2.51	2.51	2.51	2.51	2.51
Key Financial Ratios:					
O&M Reserve (Days)	90.0	90.0	90.0	90.0	90.0
Debt Service Coverage					
Fee Revenues	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348	$ 4,542,348
Less: O&M Expense	(1,931,821)	(2,251,900)	(2,655,804)	(2,801,435)	(2,984,405)
Available for Debt Service Coverage	$ 2,610,526	$ 2,290,448	$ 1,886,544	$ 1,740,913	$ 1,557,943
Debt Service	978,575	978,281	978,281	978,281	978,281
Coverage Ratio	2.67	2.34	1.93	1.78	1.59
Coverage Target	1.35	1.35	1.35	1.35	1.35
	-	-	-	-	-

Appendix 12B

Personnel Budget

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
PERSONNEL ADDITIONS

	Initial Year	Group	Class	Base Hourly Rate	Projected Salaries and Wages Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Existing Personnel									
Sweeper Operator	2012	C-06	TRD950	$ 11.22	$ 23,338	$ 23,804	$ 24,280	$ 24,766	$ 25,261
Sweeper Operator	2012	C-06	TRD950	11.22	23,338	23,804	24,280	24,766	25,261
Sweeper Operator	2012	C-06	TRD950	11.22	23,338	23,804	24,280	24,766	25,261
Sweeper Operator	2012	C-06	TRD950	11.22	23,338	23,804	24,280	24,766	25,261
Operator (Hydroscopic Exc)	2012	C-09	TRD220	13.17	27,394	27,941	28,500	29,070	29,652
Equipment Operator I	2012	C-05	TRD221	10.70	22,256	22,701	23,155	23,618	24,091
Concrete Foreman II	2012	C-10	MGT222	13.92	28,954	29,533	30,123	30,726	31,340
Concrete Finisher	2012	C-06	TRD222	11.22	23,338	23,804	24,280	24,766	25,261
Concrete Finisher	2012	C-06	TRD222	11.22	23,338	23,804	24,280	24,766	25,261
Subtotal					$ 218,629	$ 223,001	$ 227,461	$ 232,011	$ 236,651
FTE Additions									
Worker (Concrete Crew)	2012	C-04	TRD930	$ 10.24	$ 21,299	$ 21,725	$ 22,160	$ 22,603	$ 23,055
Worker (Concrete Crew)	2012	C-04	TRD930	10.24	21,299	21,725	22,160	22,603	23,055
Worker (Concrete Crew)	2012	C-04	TRD930	10.24	21,299	21,725	22,160	22,603	23,055
Supervisor	2012	C-14	MGT220	16.98	35,318	36,025	36,745	37,480	38,230
Sweeper Operator	2012	C-06	TRD950	11.22	23,338	23,804	24,280	24,766	25,261
Foreman II - TV Crew	2012	C-10	MGT222	13.92	28,954	29,533	30,123	30,726	31,340
Worker - TV Crew	2012	C-04	TRD930	10.24	21,299	21,725	22,160	22,603	23,055
Operator - Vac/Jetter Truck Crew	2013	C-07	TRD960	11.75	-	24,929	25,427	25,936	26,455
Worker - Vac/Jetter Truck Crew	2013	C-04	TRD930	10.24	-	21,725	22,160	22,603	23,055
Worker - Storm drain Crew 1	2013	C-04	TRD930	10.24	-	21,725	22,160	22,603	23,055
Worker - Storm drain Crew 1	2013	C-04	TRD930	10.24	-	21,725	22,160	22,603	23,055
Roll-off Operator	2013	C-08	TRD951	12.30	-	26,096	26,618	27,150	27,693
Operator - Const. Crew 1	2014	C-07	TRD960	11.75	-	-	25,427	25,936	26,455
Worker - Const. Crew 1	2014	C-04	TRD930	10.24	-	-	22,160	22,603	23,055
Dump Truck Driver - Const. Crew 1	2014	C-05	TRD221	10.70	-	-	23,155	23,618	24,091
Foreman II - Const. Crew 1	2014	C-10	MGT222	13.92	-	-	30,123	30,726	31,340
Worker - Const. Crew 1	2014	C-04	TRD930	10.24	-	-	22,160	22,603	23,055
Dump Truck Driver - Const. Crew 1	2014	C-05	TRD221	10.70	-	-	23,155	23,618	24,091
Boom Truck Driver - Const. Crew 1	2015	C-07	TRD960	11.75	-	-	-	25,936	26,455
Backhoe Operator - Concrete Excavation Crew 1	2016	C-07	TRD960	11.75	-	-	-	-	26,455
Worker- Concrete Excavation Crew 1	2016	C-04	TRD930	10.24	-	-	-	-	23,055
Subtotal					$ 172,806	$ 292,463	$ 444,492	$ 479,318	$ 538,414
Total Salaries and Wages					$ 391,435	$ 515,464	$ 671,954	$ 711,329	$ 775,065
Total Benefits					212,170	281,983	368,809	390,215	425,863
Total Personnel Cost					$ 603,606	$ 797,447	$ 1,040,762	$ 1,101,543	$ 1,200,927

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
PERSONNEL COST DETAIL

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
TOTAL PERSONNEL COST					
Salary	$ 391,435	$ 515,464	$ 671,954	$ 711,329	$ 775,065
Medicare	5,676	7,474	9,743	10,314	11,238
Social	24,269	31,959	41,661	44,102	48,054
Unemployment	780	1,023	1,316	1,365	1,462
Workers Comp	7,829	10,309	13,439	14,227	15,501
TMRS	55,153	72,629	94,678	100,226	109,207
Health	118,272	158,337	207,647	219,645	240,040
Life	192	252	324	336	360
Total Employee Cost	$ 603,606	$ 797,447	$ 1,040,762	$ 1,101,543	$ 1,200,927
Sweeper Operator					
Salary	$ 23,338	$ 23,804	$ 24,280	$ 24,766	$ 25,261
Medicare	338	345	352	359	366
Social	1,447	1,476	1,505	1,535	1,566
Unemployment	49	49	49	49	49
Workers Comp	467	476	486	495	505
TMRS	3,288	3,354	3,421	3,490	3,559
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 36,331	$ 37,056	$ 37,796	$ 38,551	$ 39,320
Sweeper Operator					
Salary	$ 23,338	$ 23,804	$ 24,280	$ 24,766	$ 25,261
Medicare	338	345	352	359	366
Social	1,447	1,476	1,505	1,535	1,566
Unemployment	49	49	49	49	49
Workers Comp	467	476	486	495	505
TMRS	3,288	3,354	3,421	3,490	3,559
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 36,331	$ 37,056	$ 37,796	$ 38,551	$ 39,320
Sweeper Operator					
Salary	$ 23,338	$ 23,804	$ 24,280	$ 24,766	$ 25,261
Medicare	338	345	352	359	366
Social	1,447	1,476	1,505	1,535	1,566
Unemployment	49	49	49	49	49
Workers Comp	467	476	486	495	505
TMRS	3,288	3,354	3,421	3,490	3,559
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 36,331	$ 37,056	$ 37,796	$ 38,551	$ 39,320
Sweeper Operator					
Salary	$ 23,338	$ 23,804	$ 24,280	$ 24,766	$ 25,261
Medicare	338	345	352	359	366
Social	1,447	1,476	1,505	1,535	1,566
Unemployment	49	49	49	49	49
Workers Comp	467	476	486	495	505
TMRS	3,288	3,354	3,421	3,490	3,559
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 36,331	$ 37,056	$ 37,796	$ 38,551	$ 39,320
Operator (Hydroscopic Exc)					
Salary	$ 27,394	$ 27,941	$ 28,500	$ 29,070	$ 29,652
Medicare	397	405	413	422	430
Social	1,698	1,732	1,767	1,802	1,838
Unemployment	49	49	49	49	49
Workers Comp	548	559	570	581	593
TMRS	3,860	3,937	4,016	4,096	4,178
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 41,350	$ 42,175	$ 43,018	$ 43,877	$ 44,753
Equipment Operator I					
Salary	$ 22,256	$ 22,701	$ 23,155	$ 23,618	$ 24,091
Medicare	323	329	336	342	349
Social	1,380	1,407	1,436	1,464	1,494
Unemployment	49	49	49	49	49
Workers Comp	445	454	463	472	482
TMRS	3,136	3,199	3,263	3,328	3,394
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 34,992	$ 35,691	$ 36,404	$ 37,130	$ 37,872
Concrete Foreman II					
Salary	$ 28,954	$ 29,533	$ 30,123	$ 30,726	$ 31,340
Medicare	420	428	437	446	454
Social	1,795	1,831	1,868	1,905	1,943
Unemployment	49	49	49	49	49
Workers Comp	579	591	602	615	627
TMRS	4,080	4,161	4,244	4,329	4,416
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 43,280	$ 44,144	$ 45,026	$ 45,925	$ 46,843

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
PERSONNEL COST DETAIL

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Concrete Finisher					
Salary	$ 23,338	$ 23,804	$ 24,280	$ 24,766	$ 25,261
Medicare	338	345	352	359	366
Social	1,447	1,476	1,505	1,535	1,566
Unemployment	49	49	49	49	49
Workers Comp	467	476	486	495	505
TMRS	3,288	3,354	3,421	3,490	3,559
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 36,331	$ 37,056	$ 37,796	$ 38,551	$ 39,320
Concrete Finisher					
Salary	$ 23,338	$ 23,804	$ 24,280	$ 24,766	$ 25,261
Medicare	338	345	352	359	366
Social	1,447	1,476	1,505	1,535	1,566
Unemployment	49	49	49	49	49
Workers Comp	467	476	486	495	505
TMRS	3,288	3,354	3,421	3,490	3,559
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 36,331	$ 37,056	$ 37,796	$ 38,551	$ 39,320
Worker (Concrete Crew)					
Salary	$ 21,299	$ 21,725	$ 22,160	$ 22,603	$ 23,055
Medicare	309	315	321	328	334
Social	1,321	1,347	1,374	1,401	1,429
Unemployment	49	49	49	49	49
Workers Comp	426	435	443	452	461
TMRS	3,001	3,061	3,122	3,185	3,248
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 33,808	$ 34,483	$ 35,172	$ 35,874	$ 36,590
Worker (Concrete Crew)					
Salary	$ 21,299	$ 21,725	$ 22,160	$ 22,603	$ 23,055
Medicare	309	315	321	328	334
Social	1,321	1,347	1,374	1,401	1,429
Unemployment	49	49	49	49	49
Workers Comp	426	435	443	452	461
TMRS	3,001	3,061	3,122	3,185	3,248
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 33,808	$ 34,483	$ 35,172	$ 35,874	$ 36,590
Worker (Concrete Crew)					
Salary	$ 21,299	$ 21,725	$ 22,160	$ 22,603	$ 23,055
Medicare	309	315	321	328	334
Social	1,321	1,347	1,374	1,401	1,429
Unemployment	49	49	49	49	49
Workers Comp	426	435	443	452	461
TMRS	3,001	3,061	3,122	3,185	3,248
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 33,808	$ 34,483	$ 35,172	$ 35,874	$ 36,590
Supervisor					
Salary	$ 35,318	$ 36,025	$ 36,745	$ 37,480	$ 38,230
Medicare	512	522	533	543	554
Social	2,190	2,234	2,278	2,324	2,370
Unemployment	49	49	49	49	49
Workers Comp	706	720	735	750	765
TMRS	4,976	5,076	5,177	5,281	5,387
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 51,156	$ 52,178	$ 53,220	$ 54,283	$ 55,368
Sweeper Operator					
Salary	$ 23,338	$ 23,804	$ 24,280	$ 24,766	$ 25,261
Medicare	338	345	352	359	366
Social	1,447	1,476	1,505	1,535	1,566
Unemployment	49	49	49	49	49
Workers Comp	467	476	486	495	505
TMRS	3,288	3,354	3,421	3,490	3,559
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 36,331	$ 37,056	$ 37,796	$ 38,551	$ 39,320
Foreman II - TV Crew					
Salary	$ 28,954	$ 29,533	$ 30,123	$ 30,726	$ 31,340
Medicare	420	428	437	446	454
Social	1,795	1,831	1,868	1,905	1,943
Unemployment	49	49	49	49	49
Workers Comp	579	591	602	615	627
TMRS	4,080	4,161	4,244	4,329	4,416
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 43,280	$ 44,144	$ 45,026	$ 45,925	$ 46,843

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
PERSONNEL COST DETAIL

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Worker - TV Crew					
Salary	$ 21,299	$ 21,725	$ 22,160	$ 22,603	$ 23,055
Medicare	309	315	321	328	334
Social	1,321	1,347	1,374	1,401	1,429
Unemployment	49	49	49	49	49
Workers Comp	426	435	443	452	461
TMRS	3,001	3,061	3,122	3,185	3,248
Health	7,392	7,540	7,691	7,844	8,001
Life	12	12	12	12	12
Total Employee Cost	$ 33,808	$ 34,483	$ 35,172	$ 35,874	$ 36,590
Operator - Vac/Jetter Truck Crew					
Salary	$ -	$ 24,929	$ 25,427	$ 25,936	$ 26,455
Medicare	-	361	369	376	384
Social	-	1,546	1,576	1,608	1,640
Unemployment	-	49	49	49	49
Workers Comp	-	499	509	519	529
TMRS	-	3,512	3,583	3,654	3,727
Health	-	7,540	7,691	7,844	8,001
Life	-	12	12	12	12
Total Employee Cost	$ -	$ 38,447	$ 39,215	$ 39,998	$ 40,797
Worker - Vac/Jetter Truck Crew					
Salary	$ -	$ 21,725	$ 22,160	$ 22,603	$ 23,055
Medicare	-	315	321	328	334
Social	-	1,347	1,374	1,401	1,429
Unemployment	-	49	49	49	49
Workers Comp	-	435	443	452	461
TMRS	-	3,061	3,122	3,185	3,248
Health	-	7,540	7,691	7,844	8,001
Life	-	12	12	12	12
Total Employee Cost	$ -	$ 34,483	$ 35,172	$ 35,874	$ 36,590
Worker - Storm drain Crew 1					
Salary	$ -	$ 21,725	$ 22,160	$ 22,603	$ 23,055
Medicare	-	315	321	328	334
Social	-	1,347	1,374	1,401	1,429
Unemployment	-	49	49	49	49
Workers Comp	-	435	443	452	461
TMRS	-	3,061	3,122	3,185	3,248
Health	-	7,540	7,691	7,844	8,001
Life	-	12	12	12	12
Total Employee Cost	$ -	$ 34,483	$ 35,172	$ 35,874	$ 36,590
Worker - Storm drain Crew 1					
Salary	$ -	$ 21,725	$ 22,160	$ 22,603	$ 23,055
Medicare	-	315	321	328	334
Social	-	1,347	1,374	1,401	1,429
Unemployment	-	49	49	49	49
Workers Comp	-	435	443	452	461
TMRS	-	3,061	3,122	3,185	3,248
Health	-	7,540	7,691	7,844	8,001
Life	-	12	12	12	12
Total Employee Cost	$ -	$ 34,483	$ 35,172	$ 35,874	$ 36,590
Roll-off Operator					
Salary	$ -	$ 26,096	$ 26,618	$ 27,150	$ 27,693
Medicare	-	378	386	394	402
Social	-	1,618	1,650	1,683	1,717
Unemployment	-	49	49	49	49
Workers Comp	-	522	532	543	554
TMRS	-	3,677	3,750	3,825	3,902
Health	-	7,540	7,691	7,844	8,001
Life	-	12	12	12	12
Total Employee Cost	$ -	$ 39,891	$ 40,688	$ 41,501	$ 42,329
Operator - Const. Crew 1					
Salary	$ -	$ -	$ 25,427	$ 25,936	$ 26,455
Medicare	-	-	369	376	384
Social	-	-	1,576	1,608	1,640
Unemployment	-	-	49	49	49
Workers Comp	-	-	509	519	529
TMRS	-	-	3,583	3,654	3,727
Health	-	-	7,691	7,844	8,001
Life	-	-	12	12	12
Total Employee Cost	$ -	$ -	$ 39,215	$ 39,998	$ 40,797
Worker - Const. Crew 1					
Salary	$ -	$ -	$ 22,160	$ 22,603	$ 23,055
Medicare	-	-	321	328	334
Social	-	-	1,374	1,401	1,429
Unemployment	-	-	49	49	49
Workers Comp	-	-	443	452	461
TMRS	-	-	3,122	3,185	3,248
Health	-	-	7,691	7,844	8,001
Life	-	-	12	12	12
Total Employee Cost	$ -	$ -	$ 35,172	$ 35,874	$ 36,590

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
PERSONNEL COST DETAIL

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Dump Truck Driver - Const. Crew 1					
Salary	$ -	$ -	$ 23,155	$ 23,618	$ 24,091
Medicare	-	-	336	342	349
Social	-	-	1,436	1,464	1,494
Unemployment	-	-	49	49	49
Workers Comp	-	-	463	472	482
TMRS	-	-	3,263	3,328	3,394
Health	-	-	7,691	7,844	8,001
Life	-	-	12	12	12
Total Employee Cost	$ -	$ -	$ 36,404	$ 37,130	$ 37,872
Foreman II - Const. Crew 1					
Salary	$ -	$ -	$ 30,123	$ 30,726	$ 31,340
Medicare	-	-	437	446	454
Social	-	-	1,868	1,905	1,943
Unemployment	-	-	49	49	49
Workers Comp	-	-	602	615	627
TMRS	-	-	4,244	4,329	4,416
Health	-	-	7,691	7,844	8,001
Life	-	-	12	12	12
Total Employee Cost	$ -	$ -	$ 45,026	$ 45,925	$ 46,843
Worker - Const. Crew 1					
Salary	$ -	$ -	$ 22,160	$ 22,603	$ 23,055
Medicare	-	-	321	328	334
Social	-	-	1,374	1,401	1,429
Unemployment	-	-	49	49	49
Workers Comp	-	-	443	452	461
TMRS	-	-	3,122	3,185	3,248
Health	-	-	7,691	7,844	8,001
Life	-	-	12	12	12
Total Employee Cost	$ -	$ -	$ 35,172	$ 35,874	$ 36,590
Dump Truck Driver - Const. Crew 1					
Salary	$ -	$ -	$ 23,155	$ 23,618	$ 24,091
Medicare	-	-	336	342	349
Social	-	-	1,436	1,464	1,494
Unemployment	-	-	49	49	49
Workers Comp	-	-	463	472	482
TMRS	-	-	3,263	3,328	3,394
Health	-	-	7,691	7,844	8,001
Life	-	-	12	12	12
Total Employee Cost	$ -	$ -	$ 36,404	$ 37,130	$ 37,872
Boom Truck Driver - Const. Crew 1					
Salary	$ -	$ -	$ -	$ 25,936	$ 26,455
Medicare	-	-	-	376	384
Social	-	-	-	1,608	1,640
Unemployment	-	-	-	49	49
Workers Comp	-	-	-	519	529
TMRS	-	-	-	3,654	3,727
Health	-	-	-	7,844	8,001
Life	-	-	-	12	12
Total Employee Cost	$ -	$ -	$ -	$ 39,998	$ 40,797
Backhoe Operator - Concrete Excavation Crew 1					
Salary	$ -	$ -	$ -	$ -	$ 26,455
Medicare	-	-	-	-	384
Social	-	-	-	-	1,640
Unemployment	-	-	-	-	49
Workers Comp	-	-	-	-	529
TMRS	-	-	-	-	3,727
Health	-	-	-	-	8,001
Life	-	-	-	-	12
Total Employee Cost	$ -	$ -	$ -	$ -	$ 40,797
Worker- Concrete Excavation Crew 1					
Salary	$ -	$ -	$ -	$ -	$ 23,055
Medicare	-	-	-	-	334
Social	-	-	-	-	1,429
Unemployment	-	-	-	-	49
Workers Comp	-	-	-	-	461
TMRS	-	-	-	-	3,248
Health	-	-	-	-	8,001
Life	-	-	-	-	12
Total Employee Cost	$ -	$ -	$ -	$ -	$ 36,590

Appendix 12C

Equipment Budget

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
EQUIPMENT ADDITIONS

	Year of Purchase	Estimated Current Cost	Estimated Cost in Year of Purchase	Monthly Operating Rate	Projected Operating Cost Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Existing Equipment									
Hydroscopic Excavator Gradall XL4100	2012			$ 2,628	$ 31,536	$ 32,482	$ 33,457	$ 34,460	$ 35,494
Dump Truck, 12 yd, 50,000GVW	2012			2,248	26,976	27,785	28,619	29,477	30,362
Sweeper	2012			6,402	76,824	79,129	81,503	83,948	86,466
Sweeper	2012			6,402	76,824	79,129	81,503	83,948	86,466
Sweeper	2012			6,402	76,824	79,129	81,503	83,948	86,466
Sweeper	2012			6,402	76,824	79,129	81,503	83,948	86,466
Sweeper	2012			6,402	76,824	79,129	81,503	83,948	86,466
2 1/2 Ton Truck	2012			1,184	14,208	14,634	15,073	15,525	15,991
1 Ton Truck	2012			614	7,368	7,589	7,817	8,051	8,293
1/2 Ton Truck	2012			520	6,240	6,427	6,620	6,819	7,023
Subtotal					$ 470,448	$ 484,561	$ 499,098	$ 514,071	$ 529,493
Equipment Additions									
1 Ton Truck	2012	$ 28,000	$ 28,000	$ 614	$ 7,368	$ 7,589	$ 7,817	$ 8,051	$ 8,293
1/2 Ton Truck	2012	17,000	17,000	520	6,240	6,427	6,620	6,819	7,023
Sweeper	2012	295,000	295,000	6,402	76,824	79,129	81,503	83,948	86,466
TV Truck, Complete System, Aries	2012	300,000	300,000	9,000	108,000	111,240	114,577	118,015	121,555
Subtotal			$ 640,000						
Vac/Jetter Truck, Vactor 2100	2013	$ 275,000	$ 280,500	$ 3,680	$ -	$ 45,485	$ 46,849	$ 48,255	$ 49,702
1 Ton Truck	2013	28,000	28,560	614	-	7,589	7,817	8,051	8,293
Roll-off Container / Tractor - Trailer	2013	92,500	94,350	1,724	-	21,309	21,948	22,606	23,285
Loader / Dump Truck 34,500 GW	2013	75,000	76,500	1,505	-	18,602	19,160	19,735	20,327
Subtotal			$ 479,910						
2 1/2 Ton Truck	2014	$ 67,000	$ 69,707	$ 1,184	$ -	$ -	$ 15,073	$ 15,525	$ 15,991
Backhoe Loader, Wheeled, Deere 410J	2014	90,000	93,636	1,374	-	-	17,492	18,017	18,557
Equipment Trailer	2014	8,000	8,323	155	-	-	1,973	2,032	2,093
Air Compressor	2014	12,000	12,485	218	-	-	2,775	2,859	2,944
Dump Truck, 12 yd, 50,000GVW	2014	75,000	78,030	2,248	-	-	28,619	29,477	30,362
1/2 Ton Truck	2014	17,000	17,687	520	-	-	6,620	6,819	7,023
2 1/2 Ton Truck	2014	67,000	69,707	1,184	-	-	15,073	15,525	15,991
Equipment Trailer	2014	8,000	8,323	155	-	-	1,973	2,032	2,093
Hydraulic Breaker	2014	5,000	5,202	150	-	-	1,910	1,967	2,026
Vibratory Plate Compactor	2014	2,500	2,601	84	-	-	1,069	1,101	1,135
Jumping Jack Compactor	2014	2,000	2,081	60	-	-	764	787	810
Arrow Board	2014	4,500	4,682	135	-	-	1,719	1,770	1,823
Dump Truck, 12 yd, 50,000GVW	2014	75,000	78,030	2,248	-	-	28,619	29,477	30,362
Subtotal			$ 450,493						
Boom Truck	2015	$ 120,000	$ 127,345	$ 2,687	$ -	$ -	$ -	$ 35,234	$ 36,291
Walk Behind Pavement Saw	2015	2,500	2,653	75	-	-	-	983	1,013
Vibratory Trench Roller	2015	24,000	25,469	537	-	-	-	7,042	7,253
Subtotal			$ 155,467						
2 1/2 Ton Truck	2016	$ 67,000	$ 72,523	$ 1,184	$ -	$ -	$ -	$ -	$ 15,991
Backhoe Loader, Wheeled, Deere 410J	2016	90,000	97,419	1,374	-	-	-	-	18,557
Equipment Trailer	2016	8,000	8,659	155	-	-	-	-	2,093
Air Compressor	2016	12,000	12,989	218	-	-	-	-	2,944
Subtotal			$ 191,590						
Total					$ 668,880	$ 781,931	$ 929,068	$ 1,000,199	$ 1,069,792

Appendix 12D

Operations of Maintenance-Line-Item Budget

CITY OF AMARILLO, TEXAS
DRAINAGE UTILITY BUDGET MODEL
OTHER OPERATIONS AND MAINTENANCE EXPENSES

	Year 1 2012	Year 2 2013	Year 3 2014	Year 4 2015	Year 5 2016
Supplies					
Office Expense	$ 516	$ 526	$ 537	$ 548	$ 559
Employee Recognition Program	210	214	218	223	227
Operating	19,969	20,368	20,776	21,191	21,615
Janitor	226	230.34	235	240	244
Clothing and Linen	2,903	2,961	3,021	3,081	3,143
Chemical and Medical	8,065	8,226	8,391	8,559	8,730
Fuel & Oil	968	987	1,007	1,027	1,048
Minor Tools	484	494	503	514	524
Auto Parts	3,549	3,620	3,692	3,766	3,841
Auto Parts Labor	807	823	839	856	873
Tires and Tubes Other	81	82	84	86	87
Natural Gas	10,322	10,529	10,739	10,954	11,173
Electricity	85,000	86,700	88,434	90,203	92,007
Water and Sewer	565	576	587	599	611
Supplies Subtotal	$ 133,663	$ 136,337	$ 139,063	$ 141,845	$ 144,682
Contractual Services					
Postage	$ 73	$ 74	$ 76	$ 77	$ 79
Tuition	97	99	101	103	105
Professional	81	82	84	86	87
R&M Improvements	500,000	510,000	520,200	530,604	541,216
Office Equipment	24	25	25	26	26
Misc. Fuel Powered Equipment	161	165	168	171	175
Shop Equipment	56	58	59	60	61
Other Equipment	645	658	671	685	698
Rental Land & Buildings	968	987	1,007	1,027	1,048
Rental City Equipment	-	-	-	-	-
Rental Other Equipment	8,065	8,226	8,391	8,559	8,730
R&M Audio / Video Equipment	7,000	7,140	7,283	7,428	7,577
Contractual Services Subtotal	$ 517,170	$ 527,513	$ 538,064	$ 548,825	$ 559,801
Other Charges					
Insurance and Bonds	$ 2,754	$ 2,809	$ 2,865	$ 2,922	$ 2,981
Communication	2,265	2,311	2,357	2,404	2,452
Travel	403	411	420	428	436
License and Permits	96	98	100	102	104
Sewer	2,984	3,044	3,105	3,167	3,230
Other Charges Subtotal	$ 8,502	$ 8,672	$ 8,846	$ 9,023	$ 9,203
TOTAL OTHER O&M	$ 659,336	$ 672,523	$ 685,973	$ 699,692	$ 713,686

Appendix 12E

General Fund Net Financial Impact

1300 E Lookout Drive, Ste 100
Richardson, TX 75082
t 972 680 2000
f 972 680 2007

515 Congress Avenue, Ste 1515
Austin, TX 78701
t 512 479 7900
f 512 479 7905

J STOWE & CO

Memo

To: Mr. Dean Frigo

From: Chris Ekrut

Date: November 21, 2011

Re: **Existing Operations and Maintenance Expenses for Drainage Utility**

Per our conversation following the City Commission work session of November 15th, this memorandum outlines our estimation of the existing direct operations and maintenance (O&M) expenses, currently contained within the Street Department budget, associated with providing drainage related services. It is our understanding that if the Drainage Utility is established, these expenses will be contained within the Drainage Utility Enterprise Fund and will be funded through the drainage utility fee revenues.

Personnel

Based on conversations with City staff, it is our understanding that nine (9) positions would be transferred from the Street Department to the Drainage Utility. These positions are listed below along with the assumed hourly rate for each class of employee.

Table 1
Employees to be Transferred to the Drainage Utility

	No. of Positions	Group	Class	Assumed Hourly Rate
Sweeper Operator	4	C-06	TRD950	$ 11.22
Equipment Operator (Hydroscopic Excavator)	1	C-09	TRD220	13.17
Equipment Operator I	1	C-05	TRD221	10.70
Concrete Foreman II	1	C-10	MGT222	13.92
Concrete Finisher	2	C-06	TRD222	11.22

To calculate the full cost of these employees inclusive of benefits, the following assumptions were made within our calculations:

- Medicare expense of 1.45% of total salaries and wages;
- Social Security expense of 6.20% of total salaries and wages;
- Workers Compensation expense of 2.00% of total salaries and wages;
- Texas Municipal Retirement System ("TMRS") expense of 14.09% of total salaries and wages;
- Unemployment expense of 0.54% of up to $9,000 of salaries and wages;
- Life Insurance cost of $12.00 per employee, per year;
- Health Insurance cost of $616.00 per employee, per month;
- All employees are assumed to work 2,080 hours per year;
- No employee is eligible for a clothing or car allowances; and
- All employees are assumed eligible for and participate in health, life, and TMRS benefit programs.

Based on the assumed hourly rates for each employee and the costing assumptions outlined above, Table 2 below illustrates the estimated total personnel expense which will be transferred from the Street Department to the Drainage Utility. For a detailed breakdown of the line-item cost by employee, please see Attachment A.

Table 2
Estimated Cost of Personnel to be Transferred

Line-Item Expense	Estimated Cost
Salaries and Wages	$ 218,629
Medicare	3,170
Social Security	13,555
Unemployment	439
Workers Comp	4,373
TMRS	30,805
Health	66,528
Life	108
Total Cost	$ 337,606

Equipment

In addition to the transfer of personnel, the cost associated with equipment used for drainage related activities will also be transferred from the Street Department to the Drainage Utility. Based on conversations with City staff, Table 3 below lists the ten (10) units of equipment to be transferred, the category of the equipment per the Municipal Garage spreadsheet provided to the Project Team, and the assumed monthly rental rate for the equipment paid to the Municipal

Garage. As illustrated, based on this information, it is estimated that approximately $470,448 in equipment expense will be transferred from the Street Department to the Drainage Utility.

Table 3
Equipment to be Transferred to the Drainage Utility

	No. of Units	Municipal Garage Category	Assumed Monthly Rental Rate (Per Unit)	Annual Rental Charge (Total)
Hydroscopic Excavator (Gradall XL4100)	1	604	$ 2,628	$ 31,536
Dump Truck, 12 yd, 50,000 GVW	1	361	2,248	26,976
Street Sweeper	5	399	6,402	384,120
2 ½ Ton Truck	1	315	1,184	14,208
1 Ton Truck	1	301	614	7,368
½ Ton Truck	1	206	520	6,240
Total Annual Cost				$ 470,448

Based on the analysis discussed above, it is estimated that, in total, $808,054 ($337,606 + $470,448) in direct labor and equipment costs related to the provision of drainage related services will be transferred from the City's Street Department to the Drainage Utility, if established.

Other O&M Expenses

Please note that this analysis only considers the largest categories of O&M expenses, personnel and equipment costs, and does not consider other potential drainage related O&M costs such as supplies and contractual services. While such drainage related expenses may currently be funded by the Street Department, the exact level of these expenses will vary annually dependent on the level of drainage related work being performed in a given year and, as a result, any quantification of these costs would be based on an allocation, rather than direct identification, of existing departmental expenditures based on historical work levels.

In addition, it should be noted that this analysis examines only direct expenditures and does not attempt to quantify the level of indirect costs (i.e., cost of General Fund department activities such as finance, human resources, information technology, etc.) incurred by the General Fund associated with drainage related activities or associated transfers from the Drainage Utility to the General Fund for such indirect costs.

Drainage Fees Paid by General Fund

Currently, it is anticipated that no discretionary exemptions from the drainage fee will be granted for City property. As such, while the General Fund will see transference of costs to the Drainage Utility as estimated above, the General Fund will also see an increase in cost to pay for drainage related service. As such, it is necessary to deduct drainage fee payments made by the General Fund from the transferred cost level in order to illustrate the net impact on the General Fund.

Based on the assumptions developed as part of the Drainage Utility Study, it is estimated that City-owned property represents approximately 2,887 equivalent residential units (ERUs). Assuming a monthly fee of $2.51 per ERU, the General Fund will be responsible for approximately $7,246 (2,887 x $2.51) a month in drainage fees, or $86,952 ($7,246 x 12) annually. Taking this into account, Table 4 below presents the total estimated net impact on the General Fund of the establishment of the Drainage Utility.

Table 4
Total Net Impact to General Fund of Drainage Utility

Line-Item Expense	Estimated Cost
Costs Transferred to Drainage Utility	
Personnel	$ 337,606
Equipment	470,448
Subtotal	$ 808,054
Less: Drainage Fees Paid by General Fund	$ 86,952
Total Net Impact to General Fund	$ 721,102

Should you have any questions regarding this memorandum or require additional information, please do not hesitate to contact me at 972.680.2000 or via e-mail at cekrut@jstoweco.com.

Cc: Michael Rice
Van Hagan
George Oswald

City of Amarillo, Texas
Drainage Utility Study
Cost of Personnel to be Transferred from Streets to Drainage Utility

	Sweeper Operator	Sweeper Operator	Sweeper Operator	Sweeper Operator	Equipment Operator (Hydroscopic Excavator)	Equipment Operator I	Concrete Foreman II	Concrete Finisher	Concrete Finisher	Total
Salary	$ 23,338	$ 23,338	$ 23,338	$ 23,338	$ 27,394	$ 22,256	$ 28,954	$ 23,338	$ 23,338	$ 218,629
Medicare	338	338	338	338	397	323	420	338	338	3,170
Social	1,447	1,447	1,447	1,447	1,698	1,380	1,795	1,447	1,447	13,555
Unemployment	49	49	49	49	49	49	49	49	49	439
Workers Comp	467	467	467	467	548	445	579	467	467	4,373
TMRS	3,288	3,288	3,288	3,288	3,860	3,136	4,080	3,288	3,288	30,805
Health	7,392	7,392	7,392	7,392	7,392	7,392	7,392	7,392	7,392	66,528
Life	12	12	12	12	12	12	12	12	12	108
Total Employee Cost	$ 36,331	$ 36,331	$ 36,331	$ 36,331	$ 41,350	$ 34,992	$ 43,280	$ 36,331	$ 36,331	$ 337,606

Task 13 Example Drainage Utility Declaration and User-Fee Ordinances

ORDINANCE NO. _____

AN ORDINANCE ESTABLISHING THE CITY OF AMARILLO DRAINAGE UTILITY AND ITS SERVICE AREA; DEDICATING CITY ASSETS TO THE UTILITY; PROVIDING FOR EXEMPTIONS; PROVIDING FOR THE CONTINUING EFFECT OF OTHER DRAINAGE REGULATIONS; AND PROVIDING FOR SEVERABILITY AND AN EFFECTIVE DATE.

BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF AMARILLO, TEXAS:

SECTION 1. FINDINGS

The City Commission of the City of Amarillo (hereinafter sometimes referred to as the "City") finds that

(a) it will establish a schedule of drainage charges against all real property in the service area subject to charges as permitted by Subchapter C, Chapter 552, Texas Local Government Code ("Subchapter C"), subject to any exemptions as required or permitted by Subchapter C;
(b) it will provide drainage for all real property in the service area on payment of drainage charges, except real property exempted in accordance with Subchapter C;
(c) it will offer drainage service on nondiscriminatory, reasonable, and equitable terms; and
(d) notice as required by Subchapter C shall be provided.

SECTION 2. ESTABLISHMENT OF DRAINAGE UTILITY AND SERVICE AREA AND DEDICATION OF ASSETS

The City adopts the provisions of Subchapter C to implement a drainage utility for the City. Accordingly, the drainage of the City of Amarillo is hereby declared to be a public utility as provided in Subchapter C.

The service area for the drainage utility shall include all real property within the city limits of the City of Amarillo as now existing or which may be annexed hereafter from time to time. The service area is more particularly identified in the attached Exhibit "A" which is incorporated herein for all purposes.

All property exempt from the provisions of this Ordinance pursuant to applicable law on the effective date of this Ordinance, including Section 552.053 of Subchapter C, shall be exempt from the provisions of this Ordinance.

The City incorporates into the drainage utility system all existing property, facilities, materials, and supplies constituting the City’s drainage system on the effective date of

this Ordinance. All future acquisitions by the City of real or personal property used in the City's drainage system shall be maintained as a part of the drainage utility.

SECTION 3. NO EFFECT ON LAND OWNER OBLIGATIONS UNDER CITY ORDINANCES; NO WAIVER OF IMMUNITY

The establishment of the drainage utility by the City does not relieve private land owners, developers, or other individuals or entities from responsibility for providing drainage improvements in connection with land development pursuant to the City of Amarillo Land Development Code and other ordinances of the City or laws of the State of Texas that relate to stormwater runoff drainage management or drainage improvements**.**

The establishment of the drainage utility does not imply or warrant that a benefitted property will be free from flooding, stormwater pollution, or stream erosion; the City makes no representation that all drainage problems will be remedied. This ordinance does not create additional duties on the part of the City or create liable for any flooding, stream erosion, deterioration of water quality, or other damages. Nothing in this ordinance shall be deemed to waive the City's immunity under state law or reduce the need or necessity for flood insurance.

SECTION 4. SEVERABILITY; EFFECTIVE DATE

If any part of this Ordinance, or the application of the same to any person or set of circumstances is for any reason held to be unconstitutional, invalid, or unenforceable, the validity of the remaining portions of this Ordinance shall not be affected thereby, this being the intent of the City Commission in adopting this Ordinance, and all provisions of this Ordinance are declared severable for that purpose. This Ordinance shall become effective from and after the day it is passed and approved.

PASSED AND APPROVED this _____ day of _____ 2012.

_____

Mayor ##########

ATTEST:

_____

##########

City Secretary

ORDINANCE NO. _____

AN ORDINANCE ADOPTING RULES FOR THE CITY OF AMARILLO DRAINAGE UTILITY; LEVYING A SCHEDULE OF DRAINAGE CHARGES; PROVIDING FOR PENALTIES AND INTEREST; AND PROVIDING FOR SEVERABILITY AND AN EFFECTIVE DATE.

BE IT ORDAINED BY THE CITY COMMISSION OF THE CITY OF AMARILLO, TEXAS:

SECTION 1. FINDINGS.

The City Commission hereby finds that notice of the charges and the establishment of the charges of the City of Amarillo Drainage Utility complies with the requirements of Subchapter C, Chapter 552, Texas Local Government Code ("Subchapter C").

SECTION 2. DEFINITIONS.

Terms not otherwise defined herein shall be given the definitions contained in Subchapter C, of the Texas Local Government Code. The following definitions shall apply to terms within this Ordinance:

(a) The Act: Subchapter C of Chapter 552 of the Texas Local Government Code.
(b) Benefited Property: An improved lot or tract to which drainage service is made available under this Ordinance.
(c) City: The City of Amarillo, Texas.
(d) Commercial Property: All improved properties within the City other than residential property, including, but not limited to, commercial, industrial, institutional, government, multi-family, mobile-home park, and religious organization land uses.
(e) Cost of Service: Costs for drainage system service to any benefited property, which shall be the total of:

(1) prorated cost of the acquisition, whether by eminent domain or otherwise, of land, rights-of-way, options to purchase land, easements, and interests in land relating to structures, equipment, and facilities used in draining the Benefited Property;
(2) prorated cost of the acquisition, construction, repair, and maintenance of structures, equipment, and facilities used in draining the Benefited Property;
(3) prorated cost or architectural, engineering, legal and related services, plant and specifications, studies, surveys, estimates of cost and of revenue, and all other expenses necessary or incident to planning, providing, or determining the feasibility and practicability of structures, equipment, and facilities used in draining the Benefited Property;
(4) prorated cost of all machinery, equipment, furniture, and facilities necessary or incident to the provision and operation of draining the Benefited Property;

(5) prorated cost of funding and financing charges and interest arising from construction projects and the start-up cost of a drainage facility used in draining the Benefited Property;

(6) prorated cost of debt service and reserve requirements of structures, equipment, and facilities provided by revenue bonds or other drainage revenue-pledge securities or obligations issued by the City; and

(7) administrative costs of operating a drainage utility system.

(f) Drainage: Public streets, bridges, catch basins, channels, conduits, creeks, culverts, detention ponds, water quality treatment ponds, ditches, draws, flumes, pipes, pumps, sloughs, treatment works, and appurtenances to those items, whether natural or artificial, or using force or gravity, that are used to draw off surface water from land, carry the water away, collect, store, or treat the water, or divert the water into natural or artificial watercourses.

(g) Drainage Utility Charge: The levy imposed to recover the cost of the service of the municipality in furnishing drainage for any benefitted property; and if specifically provided by the City by ordinance, an amount made in contribution to funding of future drainage system construction by the City.

(h) Drainage Revenue Bonds: Any obligations issued to finance the costs facilities payable and secured by a lien on and pledge of drainage utility fees.

(i) Drainage System: The drainage system owned or controlled in whole or in part by the City and dedicated to the service of Benefited Property, including any future additions, extensions, and improvements thereto and replacement thereof.

(j) Drainage Utility Fee: The Drainage Charge plus any interest and penalties paid on behalf of a Benefited Property.

(k) ERU (Equivalent Residential Unit): The unit of measure used to calculate the Drainage Utility Fee for commercial property. The ERU is the average horizontal Impervious Area for single-family property within the City.

(*l*) Facilities: The real, personal, or mixed property that is used in providing drainage and included in the System.

(m) Impervious Area or Impervious Surface: A surface which has become compacted or covered with a layer of material so that it is highly resistant to infiltration by water. Impervious areas include, but are not limited to, compacted soils, graveled surfaces subject to motorized vehicular traffic, walkways, buildings, parking lots, pavement, and private ingress/egress driveways.

(n) Improved Lot or Tract: A lot or tract that has a structure or other improvement on it that causes an impervious coverage of the soil under the structure or improvement.

(o) Parcel: One (1) or more lots or portions of lots that are contiguous and under single ownership.

(p) Public Utility: Drainage service that is regularly provided by the City through City property dedicated to that service to the users of benefited property within the service area and that is based on:

(1) an established schedule of charges;

(2) use of the police power to implement the service; and

(3) nondiscriminatory, reasonable, and equitable terms consistent with the Act.

(q) Residential Property: Any improved lot or tract with single-family, duplex, or mobile home land use.

(r) Service Area: The municipal boundaries of the City as more particularly described in Exhibit A to Ordinance _____.
(s) Residential Property: All improved single-family, duplex, condominium and mobile home land use properties.
(t) User or Customer: The person or entity that owns or occupies a Benefited Property.
(u) Wholly Sufficient and Privately Owned Drainage System: Drainage from an improved lot or tract which does not discharge into any natural or manmade waterway or drainage infrastructure including public streets, storm drains, culverts, drainage easements, or storm water ponds that are part of the Drainage System.

SECTION 3. DRAINAGE UTILITY FUND.

A separate fund is hereby created, known as the Drainage Utility Fund, for the purpose of segregating, identifying, and controlling all revenues and expenses attributable to the drainage utility. All Drainage Utility Fees shall be deposited as collected and received into this fund and shall be used exclusively for drainage cost of service. Such utility revenues may be used for the operation, planning, engineering, inspection, construction, repair, maintenance, improvement, reconstruction, administration, debt issuance cost and debt service, and other reasonable and customary charges associated with the operation of a drainage utility system. It shall not be necessary that the expenditures from the drainage utility fund for any authorized purpose specifically relate to any particular Benefited Property from which the revenues were collected.

SECTION 4. ADMINISTRATION OF DRAINAGE UTILITY.

The City Manager or his designee shall be responsible for the administration of the drainage utility, including, but not limited to, enacting any procedures necessary for the administration of the drainage charges and the consideration of appeals, development, and implementation of maintenance and facility improvement programs, state and federal regulatory compliance, and establishing drainage criteria and standards for the drainage system. The City Manager shall keep an accurate record of all properties benefited by the services and facilities of the drainage utility.

SECTION 5. DRAINAGE UTILITY CHARGE.

(a) *Establishment of a drainage utility fee.* A Drainage Utility Charge is hereby imposed upon each developed lot and parcel within the Service Area. For purposes of imposing the Drainage Utility Charge, all lots and parcels within the City are classified into the following customer categories: (1) Residential Property and (2) Commercial Property.

(b) *ERU value.* The ERU value for the City is determined through an inventory of all developed single-family residential parcels in the City and determination of Impervious Area for each parcel. Evaluation of these data determined that the equivalent residential unit Impervious Area value for assigning fees to commercial properties is two thousand eight hundred (2,800) square feet.

(c) *Residential Rates.* Based on statistical evaluation of land parcel Impervious Area for single-family properties, four rates are established for assignment of fees as follows:

a.	Tier 1 *"Small"*	0.68 ERU,	<2,072 square feet impervious area
b.	Tier 2 *"Typical"*	1.00 ERU,	2,072-3236 square feet impervious area
c.	Tier 3 *"Large"*	1.50 ERU,	>3,236 square feet impervious area

(d) *Commercial Rates.* Based on Impervious Area determination for each parcel:

Total ERU's = (Impervious Area/2,800 sq. ft.), minimum 1 ERU

The Total ERU shall be rounded to the nearest one-hundredth.

(e) *Calculation of drainage utility charge.* The monthly Drainage Utility Charge for properties shall be calculated by multiplying the total number of ERU's for the parcel by the ERU monthly billing rate.

(f) *ERU Monthly Billing Rate*. The following ERU monthly billing rate is hereby established and shall be used to calculate the total monthly Drainage Utility Charge for all property located in the City, in accordance with the applicable formula established in this subsection:

ERU rate = $#.## per ERU per month

(g) *Impervious Area determination.* The City Manager or his designee shall be responsible for determining Impervious Area of property based on reliable data, including the Appraisal Roll, geographic information system technology, aerial photography, or other reliable means for determining Impervious Area. The City Manager may require additional information from the property owner, tenant, or developer to make the determination. The amount of a charge may be revised by the City Manager based on any additions to the Impervious Area through the City approved building permit process.

(h) *Revision of Rates.* The City Commission may review the schedule of charges at any time and may increase or decrease charges upon a determination that an increase or decrease is warranted.

(i) *No credit*. No Drainage Utility Charge credit shall be given for the installation of drainage facilities required by the City Land Development Code or state law.

SECTION 6. BILLING, PAYMENTS, AND PENALTIES.

(a) Bills or statements for the drainage utility fee shall be rendered by the City for all properties subject to the fee. Bills shall be payable when rendered and shall be considered as received by the customer, whether actually received or not, when deposited in the United States mail, postage prepaid, addressed to the utility customer. Bills shall be rendered monthly for the previous month's service.

(b) For any parcel for which there is more than one User who receives utility services from an individual utility account or one or more Users for whom a utility account is not established, each User's fee shall be based upon the relative contribution to runoff of the parcel controlled by that User.

(c) Bills are due and payable on the date specified thereon and if full payment is not made by the date specified, it shall become delinquent. The City shall have the right to apply interest of ten (10) percent per month to amounts delinquent.

(d) Drainage utility fees shall be billed with the City's other public utility billings and shall be identified separately on the bill as a drainage utility fee. Delinquent drainage utility fee bills shall be mailed to the user at the address at which the user receives other City utility services, or if no other City utility services are received, to any known address for the owner or user.

(e) Penalties for Failure to Pay. Any charge due hereunder which is not paid when due will subject the user to discontinuance of all utility services provided by the City. Drainage utility fees that become delinquent pursuant to this section shall be subject to a penalty in the amount of $5.00 to cover administrative costs. Any drainage charge due hereunder which is not paid when due may be recovered in an action at law by the City including fixture of a lien against the property.

(f) The City may impose a lien against a User's property, unless it is a homestead.

(g) The City shall have access, at all reasonable times, to any benefited property served by the drainage utility for inspection, repair or enforcement of this Ordinance.

SECTION 7. APPEALS.

(a) *Administrative adjustment procedures.* Requests for adjustment of a Drainage Utility Charge shall be submitted to the City Manager. All requests shall be evaluated based upon the amount of Impervious Area only. The following procedures shall apply to all requests for adjustment of the Drainage Utility Charge:

(1) Any User who has paid Drainage Utility Charges and who believes the calculation or determination of the Drainage Utility Charge to be incorrect may, subject to the restrictions set forth in this Ordinance, submit an adjustment request to the City Manager.

(2) Requests for adjustment of Drainage Utility Charges paid by an owner, user or customer making the request shall be in writing and set forth in detail the grounds upon which relief is sought.

(3) Adjustment requests will be reviewed by the City Manager within thirty (30) days from the date of receipt of an adjustment request. Adjustments resulting from such a request shall be prospective, but may be made retroactive for no greater time period than three (3) months prior to the receipt of the request.

(4) The User requesting an adjustment may be required, at the requesting party's own cost, to provide supplemental information to the City Manager, including,

but not limited to, survey data certified by a Texas registered professional land surveyor (R.P.L.S.), or a development plan approved by the City. Failure to provide requested information may result in the denial of the adjustment request.

(5) The City Manager's determination of the adjustment request shall be provided in writing. If the City Manager approves the request, the adjustment to the Drainage Utility Charge will be made.

(6) All findings and determinations made by the City Manager arising out of this section, except for the determination of impervious area, will be final.

(b) *Appeal of administrative adjustments.* Upon receipt of a written denial of an adjustment request, the User who requested the adjustment may, within thirty (30) days of receipt of such denial, make written application to the City Commission requesting review of the denial. The City Commission shall grant a public hearing within sixty (60) days of receipt of the request for review. The City Commission's decision shall be final.

(c) *Appeal of lien.* Before imposing a lien for delinquent Drainage Utility Fees, the City shall send notice to the record owner of the Benefitted Property of the amount of the charges owed and any penalties or interest accrued, and of the owner's right to appeal the placement of the lien. Within ten working days of the postmark of the notice sent to the property owner, the owner may appeal the decision to impose the lien on the property to the City Manager. The City Manager shall not file the lien if the owner shows that the Drainage Utility Fee made the basis of the lien is not owed and shall give the owner written notice of the decision. When a person pays all principal, interest, and charges of a valid lien filed pursuant to this Ordinance, the City Manager shall execute a release of that lien and surrender it to the paying party. The paying party shall be responsible for the filing of the release.

(d) *Appeal by users outside the City's boundaries.* Users residing within the Service Area, but outside the City's boundaries, may appeal rates established for Drainage Charges to the Texas Commission on Environmental Quality as authorized by Section 13.043(b) of the Texas Water Code.

SECTION 8. EXEMPTIONS.

As required by the Act and Chapter 580 of the Texas Local Government Code, the following properties shall be exempt from the provisions of this Ordinance:

(1) property with proper construction and maintenance of a wholly sufficient and privately owned drainage system;

(2) property held and maintained in its natural state, until such time that the property is developed and all of the public infrastructure constructed has been accepted by the municipality in which the property is located for maintenance;

(3) a subdivided lot, until a structure has been built on the lot and a certificate of occupancy has been issued by the municipality in which the property is located; and

(4) property owned by the State or any public or private institution of higher education.

SECTION 9. SEVERABILITY; EFFECTIVE DATE

If any part of this Ordinance, or the application of the same to any person or set of circumstances is for any reason held to be unconstitutional, invalid, or unenforceable, the validity of the remaining portions of this Ordinance shall not be affected thereby, this being the intent of the City Commission in adopting this Ordinance, and all provisions of this Ordinance are declared severable for that purpose. This Ordinance shall become effective from and after the day it is passed and approved.

PASSED AND APPROVED this _____ day of _____ 2012.

_____

Mayor ##########

ATTEST:

_____

##########

City Secretary

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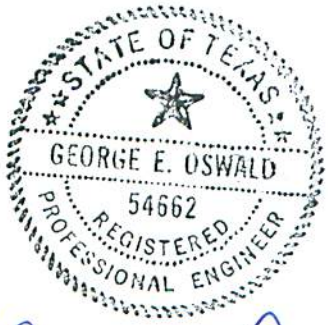
Amarillo Drainage Utility Study
Public Outreach / Information

Prepared for:

City of Amarillo
509 S.E. 7th Avenue
Amarillo, Texas 79101

Project No. 11020.00
TBPE Firm Reg. No. F-293

March 13, 2012



Task 14 Amarillo Drainage Utility Study Public Outreach / Information

Summary

A series of four public meetings were conducted on January 11th, 12th, 18th, and 19th, 2012 to provide information on the Drainage Utility concept, the Drainage Utility Study findings, proposed user-fee customer rate structure, and proposed drainage management program enhancements supported by Drainage Utility revenue. The meetings were held at Emerson Elementary School, Tradewind Elementary School, San Jacinto Elementary School, and Puckett Elementary School. Additionally, Drainage Utility information was posted on the City's web site.

The presentation used in the public meetings, notes taken during each meeting, meeting attendees sign-in sheets, and City website public outreach / information content are included in **Appendices 14A – 14D** to this section.

A total of 66 citizens attended the public meetings. Television and print media covered the meetings. Mayor Paul Harpole and Commissioner Jim Simms attended one meeting each. All meetings were attended by City staff to provide support and to respond to citizen questions and concerns.

Major Issues Expressed by Citizens and Responses Provided

Taxation vs. User-Fee

Can required revenue be developed via sales tax or property tax?

The City's Sales tax rate is already at the maximum allowable.

The property tax rate would need to increase more than 17 percent to develop the $4.5 million in revenue need to support the proposed drainage management program.

There is a perception that the City can reduce other general government services to free up the required program funding.

The competition for available general fund revenue for basic public safety programs will not allow service reduction.

Isn't the user-fee a tax?

No, the Drainage Utility fee is defined as user-fee by state statute.

What other options to raise revenue have been considered?

The general fund and the Drainage Utility are the only viable options to provide long-term financial support for the drainage management program.

Is the User-fee tax deductible?

No, a user–fee is not a tax.

Will there be a referendum vote?

No, by state statute only Commission action on two implementation ordinances following public hearings is required.

Impact on fixed-income citizens.

The proposed user-fee is modest; the typical single-family fee is $2.51 per month. This amount will increase the typical total residential utility bill by about 5%.

What happens to the $808,000 now being spent for drainage management service if the Drainage Utility is implemented?

This funding will remain in the general fund.

Are there other cities the size of Amarillo with a Drainage Utility?

There are over 60 municipal drainage utilities operating in Texas. There are thirteen cities greater than 150,000 population with drainage utilities in place.

When the proposed construction projects get going, the City will suffer from digging up alleys and streets.

Yes, significant land disturbance is required to accommodate construction activities.

What about rainwater collection systems and other conservation measures?

These measures are under consideration by the City Commission.

It only floods for 2-3 hours after large rainfall events, why do we need to spend more money?

Flooding conditions in Amarillo are significant including interior building flooding, threat to life safety on flooded roadways, and severe impediment to public safety first-responder travel.

User-fees and taxes always go up, how long will the fee remain unchanged, how high will the fee go?

The user-fee rate is proposed to remain unchanged for 5-years; the City Commission will review annually as part of the City's budgeting process.

Who will be in charge of the Drainage Utility?

Public Works (not a new department).

Exemptions

Why are there exemptions? Doesn't make sense.

Certain exemptions are mandatory by state statute, others are allowable.

Is City property charged the utility user-fee?

Yes.

Are streets and sidewalks included in the City fee?

No, streets and right-of-way areas are part of the drainage system.

AISD requested an exemption, stated that the user-fee is equivalent to 2 teacher positions.

Exemptions push burden to remaining customers. The user-fee is the most equitable means of distributing program costs.

Private drainage system, what is it?

For a property to meet the private drainage system criteria in the state statute under which the Drainage Utility operates there must be no storm water run-off discharge from the property to City infrastructure or waterways. For example, a property situated on the city limits boundary with all runoff leaving the City without entering any component of the drainage system would meet the criteria.

This is a tax because it is not by choice.

If a property owner can achieve no discharge to City drainage system condition, there will be no user-fee charge assigned.

If I add on to my house, do I have to pay more?

Yes, if your property's impervious area total places the property in a higher user-fee tier.

Can the City's drainage program be privatized?

Not likely. There are significant liability risks.

Why is the City considering this program now given the current depressed national economy and ongoing drought conditions?

Drainage Utility consideration was the highest priority recommendation of the 2010 Comprehensive Plan.

Can revenue be used for purposes other than drainage?

No, by state statute Drainage Utility revenue must be managed in a protected enterprise fund account.

New development should not be subject to the drainage fee because of infrastructure cost.

Infrastructure associated with new land development comes into the public domain for long-term maintenance/rehabilitation/replacement at City cost. By state statute, all developed land is subject to the Drainage Utility user-fee other than property classes exempt by state statute. New development is not an exempt class.

Is the drainage user-fee taxable?

No.

Will the user-fee be a separate bill or on the City's current utility bill?

The Drainage Utility billing will be a new line item on City's current utility bill.

Will rental properties be double-billed?

No, only the occupant OR owner will be billed.

How is the commercial fee determined?

Each 2800 square feet of impervious area is billed $2.51/month.

What about properties not currently receiving City utility services?

New Drainage Utility-only accounts will be established for these properties.

Does the City need to raise design standards for new development?

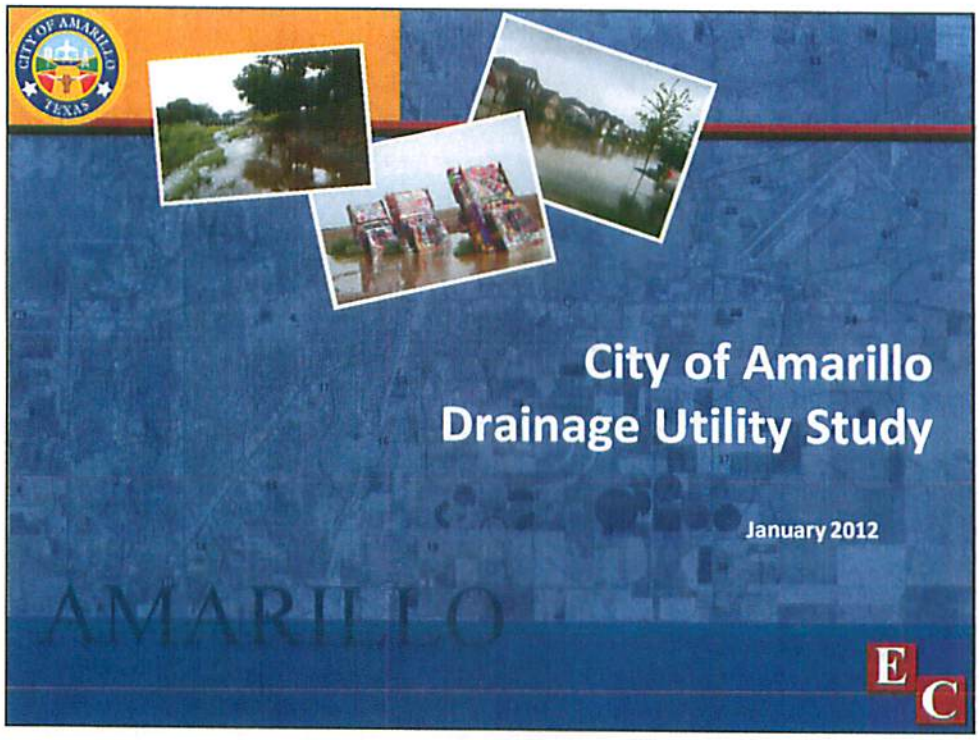
Increasing the capacity of new drainage infrastructure must be balanced against increased construction costs. Increasing street drainage capacity from the current 2-year storm flow capacity standard to a 5- or 10-year standard will increase drainage infrastructure costs by 25% and 40%, respectively.

Comments were received at each meeting stating support for the Drainage Utility, particularly from younger (under 40) citizens. Some citizens also voiced appreciation for the meetings as an opportunity to learn more about the Drainage Utility proposal. Supportive comments included:

- Implementation of a Drainage Utility is long overdue,
- The City needs to do "whatever it takes" to address drainage problems,
- The proposed Utility is a good solution because it will generate dedicated funding for drainage problems,
- The proposal provides a long-term plan to correct drainage problems for a reasonable cost relative to the liabilities of poor drainage, and
- The proposed fees are very reasonable and should not affect anyone's standard of living or result in increased costs of goods and services.

Appendix 14A

Public Meetings Presentation



Presentation Outline

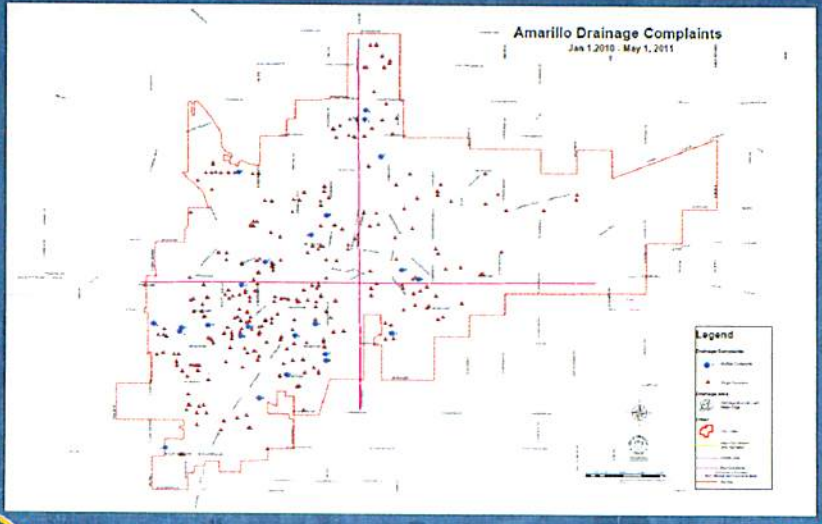
- Why is the City Considering the Drainage Utility?
- What is a Drainage Utility?
- How are Customer User-Fees Assigned to Property?
- User-Fee Comparison to other Cities
- How Will I Get My Bill?
- Will a Drainage Utility Solve All Problems?
- Implementation Steps-Schedule

Why is the City Considering the Drainage Utility?

- Amarillo's flat topography and playa lakes present unique drainage requirements.
- In 2008-2011, over 1000 drainage problems reported.
- Backlog of 55 flood reduction projects totaling $66,000,000 in need of funding.
- Drainage system requires cleaning and periodic rehabilitation/replacement to function properly.
  - *180 miles of pipe/culverts and 3,300 curb inlets*
- General Fund (Property & Sales Tax Revenue) has not met funding needs.

Without stable funding, challenges will remain.

Drainage Complaints 2010-2011



What is a Drainage Utility?---Not a Tax!

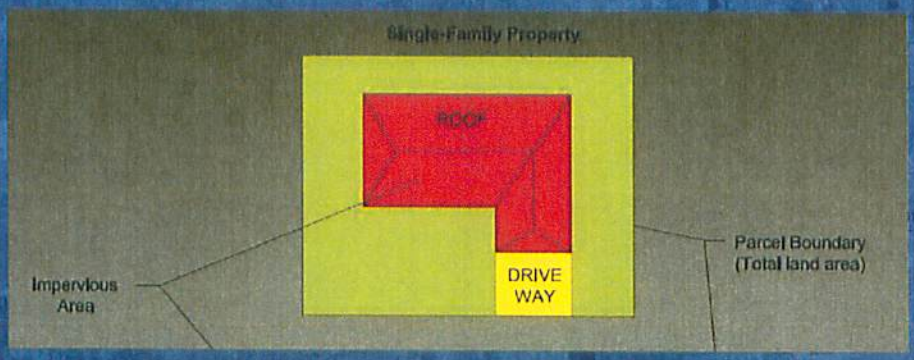
- User-Fee, like Water/Wastewater/Solid Waste
- Equitable User-Fee Basis: property stormwater run-off demand on drainage system
  - *Impervious cover, i.e. rooftops, driveways/walkways, parking*
- Guided by State Law, no property value consideration
- User-Fee Collected on City Utility Bill
- Provides Stable Revenue Stream
  - *Managed in protected account*
  - *Supports long-term program implementation*

How are User-Fees Assigned?

- Impervious Area
  - *Rooftops, Parking, Driveways, Walkways*
  - *Increases Volume & Rate of Runoff*
- Equivalent Residential Unit (ERU)
  - *Average Sq Ft for Single-Family Properties-2800*
  - *Used as Billing Standard*
- Rate Structure
  - *Single-Family, Multi-Tier*
  - *Commercial/MF/Industrial/Institutional/Religious*

Primary Land Data Sources-PRAD building footprint, parking area and aerial photography

Single-Family Impervious Area Determination

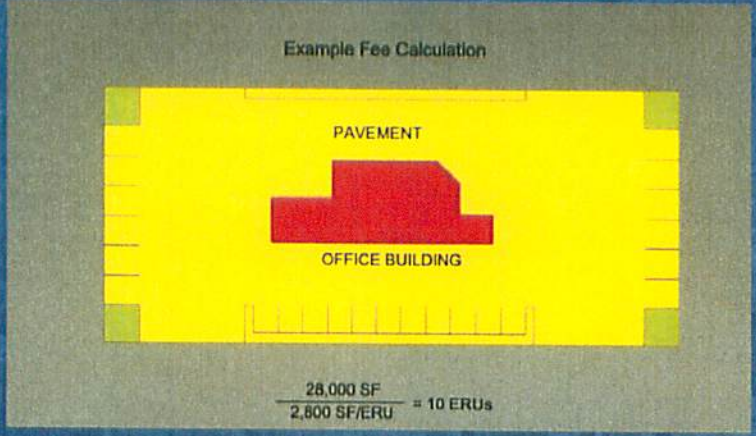


- Roof + Driveway + Walkways + Patios + Outbuildings
- Sidewalks are not included in impervious area total

Proposed Utility Rate Structure

- **ERU Value – 2,800 sq. ft. Impervious Area (IA)**
- **Single-Family: Three Tiered**
  - *"Small"* *0.68 ERU, <2,072 sq. ft. IA, $1.71/mo.*
  - *"Typical"* *1.0 ERU, 2,072-3,236 sq. ft. IA, $2.51/mo.*
  - *"Large"* *1.5 ERU, >3,236 sq. ft. IA, $3.79/mo.*
- **Commercial/Industrial/City/County/School District/Religious/Apartment Complex**
  - *15.6 ERU per Acre Impervious Area, $39.15/mo.*

Example Commercial Utility Billing Calculation



- Impervious Area = Building Roof + Parking

5-Year Budget Scenario

- **ERU rate $2.51/month**
  - ***Residential***
    - **Small-$1.71/mo., Typical-$2.51/mo., Large-$3.79/mo.**
  - ***Commercial*-$2.51/month/2800 sq. ft. impervious area**
- **Results:**
  - ***Annual Revenue: $4,542,000, $24 per person***
  - ***CIP-$12M debt issue in year-one, start 4 projects***
  - ***Builds $2M Repair/Replacement Reserve***
  - ***Dedicated Infrastructure Maintenance Program***
    - **Transfer 9 existing positions and equipment from Street Department**
    - **Add 21 new positions and equipment over 5-years**

Exemptions
Texas Local Government Code Chapters 552.C and 580

Statutory (Mandatory)

- Undeveloped Land
- Institutions of Higher Education
- Property with Private Drainage System
  - *No discharge to City infrastructure or waterways*
- State Property

E C

Monthly User-Fee Comparison

City	ERU Rate	Annual Revenue Per Person
Amarillo	$2.51	$24
Abilene	$2.45	$16
El Paso	$2.97	$23
Fort Worth	$5.40	$43
Laredo	$6.50	$28
Lubbock	$12.00	$72
San Angelo	$4.00	$30
Wichita Falls	$3.55	$24

Over 60 drainage utilities in Texas

E C

Proposed Customer Billing

- User-Fee included on City monthly utility bill.
- Sample bill mail out, August 2012
- Address customer concerns before 1st billing, October 2012
- Customer appeals process in place after 1st billing.
- What if I live on high ground and do not flood, do I pay the user-fee?
  - *Yes, all developed properties produce run-off that must be conveyed by the City drainage system*

Will the Drainage Utility Solve all Drainage Problems?

- Improved drainage system maintenance begins immediately.
- Proactive response to localized drainage problems
- Large flood-reduction project construction on prioritized basis.
- Will take many years to address flood reduction project backlog.
- User-Fee proposed to remain at initial level for 5-years.
- City Commission will review user-fee and utility progress as part of annual budget process.

Implementation Steps- Proposed Schedule

1. Public Meetings, January 2012
2. City Commission Feedback Workshop
3. Ordinance Public Hearings, March 2012
4. Sample Bill Mail-Out, August 2012
5. Resolve Customer Inquiries on Sample Bill
6. Billing Initiation, October 2012

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Appendix 14B

Public Meeting Notes

Amarillo Drainage Utility Study Public Meeting

Emerson Elementary School
1/11/12

Attendees: 15 public, 2 reporters and 2 cameramen, and City staff (Van Hagan, Michael Rice, Becky Hill, & Mark Read)

Notes:

- Need more information on who we are, purpose, etc.
- Need to spend time up front on drainage problems and need for utility.
- Separate residential/commercial ERU discussions
- O&M program – what do these 30 FTEs do?
- Lubbock reference implies Amarillo residents will eventually pay $12/month
- More information on how $4,517 was developed
- Reorganize present need, develop cost, then prepare how to fund

Questions and Answers:

1. Is RPS the design firm? No
2. O&M?
3. Bonds? Drainage Utility will support issuance of bonds.
4. House 600' from street, 3 acres of land, no drainage to street, exempt? City will hear protest for exemption.
5. Why not get money from a tax?
6. Isn't it a tax w/o calling it a tax? Not a tax, it is a community decision. "I think it's useless".
7. By calling it a fee, you get to include non-taxable exemptions? Yes
8. Is City property included? Yes
9. What happens after 5 years? Reassess progress, issue additional bonds, fee may increase ~$0.50
10. Explain 55 projects / $66M / 5 yrs / 4 projects. George Oswald explained
11. Actual cost to household? (after everyone raises costs)
    a. City does not give free.
    b. Throws out $47/per person – show calculation of $24/per person
    c. Consider adding slide to show increase to fees with exemptions
12. If I build more, do I pay more? Yes, if crosses tier. "that doesn't make sense".
13. Do other cities exempt schools? Organizations will pass on fees.
14. What about pro rata fees charged to developers?
15. Will there be a vote? Comments given to Commission to decide and will conduct public hearings, referendum vote is not required.
16. Was consideration given to reducing runoff? Discussing with City, Water Utility versus Drainage Utility
17. Conservation – does current system capture water for reuse? No. Do any of the capital projects capture water? No
18. Who are you?
19. Did you approach City or did they request? City issued a Request for Qualifications (RFQ) and out of Comprehensive Plan.
20. Offer funding options?
21. What does City currently spend on drainage? $800,000+ a year

22. What happens to that $1M? Stays in general fund.
23. What is money currently spent on? Work orders to address drainage issues.
24. Would Street Dept. Budget be reduced by $1M? Possibly, but could also be used by Streets.
25. How many new FTES? 21 over 5 years.
26. Are there other cities our size using a Drainage Utility? Yes, Amarillo is one of last 3 large cities to not have a Drainage Utility. Corpus Christi is about to implement. Brownsville has a tax based drainage district.
27. What is the City's drainage system?
28. No drainage system in our part of town.
29. Could it be privatized? Collect excess drainage and use it? Not cost feasible.
30. Could it be collected and used for recreation? Like Oklahoma City and San Antonio or other beneficial use.
31. Have you been here for our small hard rains? Yes, to re-design standard currently, discussion of 5-yr design standards.
32. You can't design a system to handle a 100-yr storm.
33. What's the $25 you just mentioned?
34. If project's get going, we have to suffer through digging up alley and streets? Yes. For how Long?
35. We don't have to do this? No, but it is positive for the community.
36. Could we have a hail utility fee? Is that a real question?

Amarillo Drainage Utility Study Public Meeting

Tradewind Elementary School
1/12/12

Attendees: 16 public, 1 reporter, Van Hagan, Michael Rice, Becky Hill, Mark Read, and Mayor Harpole

Notes:

- Add slide for introduction defining needs. -9th are photo, crumbling inlets photo, talk about maintenance cost savings. Exemption slide – add "Exemption" to title "Statutory Exemptions". Comparison slide – "Per Capita Revenue". Need to provide more background on drainage system – Michael described it well. Input and comments by Mayor and Michael were well said.

Questions and Answers:

1. What about people who have installed rain collection systems? Considering rebate or other options, gave examples.
2. Why are there exemptions? No technical reason, stated in law.
3. Is the fee state mandated? Not mandated, is a local decision.
4. Exemptions? Yes, some are mandated.
5. Why is it not the developers' responsibility? Developers are responsible when built according to drainage criteria manual.
6. It only floods for 2-3 hours after a rain, so we don't need a drainage system.
7. If the system is adequate, is it old? System is not adequate, life and property issues.
8. Only 300 complaints during an exceptionally wet year – problems are caused by filling of playas, this is a Cadillac system we don't need. Not a Cadillac system, only 4 projects have been constructed.
9. Fees/taxes always go up, never go down. State law allows for utility to be decommissioned, citizens can comment on annual budget.
10. Did you say most complaints are from Southwest Amarillo? Yes
11. So those are people with 5,000 sq ft homes that only pay $3.79 but someone with a 1,000 sq ft home pays $1.71. Yes, no perfect equitable rate structure.
12. You call it a fee and utility – is it not deductible? Correct
13. Why not raise a tax that is deductible? Would be a state increase, would not be dedicated, won't be competing.
14. Why can't the City designate five cents of the tax to damage? Can't be guaranteed/protected.
15. How high can fees go? No limit, Lubbock is highest.
16. So the Commission can't be trusted? Not exactly.
17. I expect to see a corresponding reduction in taxes. M. Rice responded – employees are Street Dept. employees that respond to stormwater emergencies.
18. Who will oversee and prioritize? Dept. of Public Works and ultimately the Commission. Public input during budget process.
19. How do you currently assess problems? Will use video technology to inspect.
20. So wastewater is a separate system? Yes, in Texas.
21. Is silting of playa lakes a problem? City does not own all playas, only excavate to increase storage.
22. Would the City use existing equipment and buildings? Buildings yes, some equipment.
23. Have you considered using sales tax? Sales tax is capped at 8.25%.

24. How long would ratios stay the same? Proposal for 5 yrs, but reviewed with annual budget.
25. Is there an alternative option? Drainage utility is the best, fairest option.
26. Wouldn't it be better to allow citizens to vote on tax increase? Some tax exempt entities will pay drainage fee.
27. How much are you going to borrow? $12M What is revenue? $45M.
28. So the Commission has authority to raise fees? Yes, Authority to implement, and to determine fee.
29. Can the City use equipment that transfers over? Yes, George Oswald explained equipment financing.
30. They can come up with other special funds to charge us? City can only create utilities that it is authorized to create.
31. You are starting slow, so the rate will goes up? It could if other projects are implemented.
32. Is there a way to privatize this and get liberals off the Commission?
33. Will most of the money go to contractors? Large projects will go to low bidder, City can handle smaller jobs efficiently.
34. Why wouldn't this be more important than a baseball park downtown? Not funded from this type of revenue stream, that does not affect this either way.
35. Thank you for making multiple presentations to the citizens have an opportunity to learn.
36. What projects have been identified? Van pointed out projects on maps.

Amarillo Drainage Utility Study Public Meeting

San Jacinto Elementary School
1/18/12

Attendees: 15 public, no media, City Manager Jarrett Atkinson, Commissioner Jim Simms, Dean Frigo, Van Hagan, Michael Rice, Mark Read, Kelly Shaw

Questions and Answers:

1. Why have only 4 projects been constructed since 1992? Competing with other projects/needs for funds.
2. Who will head the "new bureaucracy"? Not a new department; will fall within Public Works. Staff is competent.
3. Street maintenance schedule changed to 7 years from 7 months? Not addressed.
4. Comments on permits, downtown revitalization.
5. What are the 4 projects? Van showed projects on map.
6. No drainage problems near Catalpa? Why is that project needed?
7. This is a tax, not a fee because it is not by choice. You do have a choice if you can capture all runoff.
8. Fees will remain and increase. Can it be used for anything else? No, it is dedicated.
9. We need water, drainage is not a priority. City's debt is too high, don't waste money.
10. Comment in strong support of drainage utility – long overdue for Amarillo.
11. Why is Lubbock's fee so expensive? Explains Lubbock's utility.
12. Drainage is needed, but fees were paid when property was developed.
    a. Trinity Church $29,005
    b. Hillside Church >$20,000
    c. Sam's $19,900-$20,000
    d. Westgate Mall developed an extensive system for drainage when built
    e. George Oswald noted that improved drainage requires additional money, utility is best option.
13. Building versus maintenance and you should not be charged if you build drainage system. M. Rice noted that City/utility is responsible for maintenance after construction.
14. Is drainage fee taxable? City staff does not know answer.
15. So we are paying for maintenance that should have been done in the past?
16. What will we pay in 5 years? (for permit) – not a drainage utility question. City Manager gave business card and asked for call.
17. AISD rep stated that an exemption would be appreciated.
18. Are streets and sidewalks included in City's area? No, street right-of-way is part of the drainage system.
19. Where will the School's get the money? Schools and businesses will pass on the cost. Public response that this is common in other cities and will not affect retail prices.
20. Why doesn't the City pay for drainage with downtown money? Money comes from private investment and hotel taxes (cannot be used for drainage) by law. Good comments from City Manager.
21. Another public comment in favor of drainage utility – "whatever it takes".
22. Question about Globe News Center.
    a. City's portion was less than 10% and came from hotel tax.

b. Civic Center receiving no general fund money.

23. Lots of discussion on hard times/economic struggles.
24. Another positive comment. Good because it is dedicated funding.
25. Agrees with need, but need to pass cost on to younger citizens.
26. Will we get to vote on drainage utility? No, City Commission will decide.
27. We should only deal with worst drainage (highest priority) problems at a time to minimize cost. J. Simms commented problems need to be addressed today.

Amarillo Drainage Utility Study Public Meeting

Puckett Elementary School
1/19/12

Attendees: 20 public, no media, City Staff- Dean Frigo, Van Hagan, Becky Hill, Mark Read, Michael Rice

Questions and Answers:

1. What are the main problems to address?
    a. Maintenance, explain systems
    b. Design/construct 4 projects
2. What are plans for lower areas (77th and Coulter)? Don't know, refer to VH after meeting.
3. What happened to other $825,000? Returned to general fund.
4. Clarify revenue/person. Explained calculations.
5. Will it be a separate bill? Added to current bill.
6. Duplexes? Consistent with City's billing system.
7. Why now? Identified as highest priority in Capital Program (2010)
8. Rental property owners – will they be double charged? No, will not be double charged.
9. 60 drainage utilities in the State – only 2 found online. George Oswald offered to send survey from 2008. Identified 58 (2008) by checking city codes.
10. Thank you for meeting.
11. How are commercial fee determined?
    a. IA/2800 square feet x $2.51
    b. Based on aerial photography
12. What about unpermitted facilities? (e.g. snow cone stands)
    a. Drainage utility only accounts for property owner
    b. Not double counted.
13. This sounds like it is already decided. No, it was clearly stated that this is a study/proposal.
14. Why not put to a vote? Two ordinances passed in public hearings.
15. Are you affiliated with the City? No, a contractor.
16. Can we present ideas to be carried back to Commission? Yes, significant ideas relevant to drainage utility will be presented to Commission.
17. Read comments – improvements to property improve value > increase taxes for City services, City has not provided adequate services because of lack of budget prioritization.
    a. Suggest no drainage utility, revise budget, postpone "nice to have" projects.
    b. Don't increase cost of government
18. Downtown Amarillo: W-B payments, signage fees, red light camera revenue. City doesn't need more funds, needs restraint and prioritization.
19. City rainfall average is 21", what we have been doing for past years with water fees? Separate enterprise, not allowed to use for drainage.
20. I have a complete gutter/barrel system with no runoff?
21. Comment on double taxation. I pay less because I am over 65 years and taxes are frozen.
22. What are the other options to raise revenue?
    a. Add valorem tax – competition for 6 general fund
    b. Drainage district – county control

23. Where have City elected officials been if we don't have a maintenance program?
    a. Not productive to dwell on past or blame
    b. If citizens desire improved drainage, drainage utility is best option.
24. Younger person: We will inherit this system. This long-term plan will fix the problems for reasonable cost relative to liabilities of poor drainage.
25. What were specific problems during 2011? Referred to map.
26. Do we qualify for flood insurance? Yes, anyone can purchase.
27. Has anyone asked AEDC? No comment.
28. Who will control money? State law, separate account.
29. Will developers be charged? Pays fee with property sold.
30. Can this water go to lower our water bills? No separate water.
31. What were you paid? $275,000. City has engineer on staff, why did they waste money for a consultant?
32. City organization for drainage? Part of Dept. Public Works.
33. Did you decide what projects to construct? No, not involved. MR explained drainage design process.
34. Can we raise this money through new construction projects? No, developer builds to current standard and passes cost to homeowners.
35. Last year Fulton Street flooded twice in our driest year?
36. Why are we annexing more property when we should redevelop areas within the City? In Comprehensive Plan.
37. Can you get an exemption for catchment system? Yes, if it captures everything. Proposal for rebate/credit program.
38. Some comments are out of context for this meeting. How many of you went to budget meetings?
39. I have a 3,000 gal tank that overflows with 1" rain. Is this the best process?
40. Why are we filling in near pump station (77th Avenue)?
    a. Cannot reduce total playa volume or fill in playa.
    b. Pump station versus for water distribution pressure.
41. FEMA flood maps have been amended and property prices have increased.
    a. Maps were revised with better information, established by FEMA.
    b. Come talk to City Engineer.
42. Why are houses built on lakes? Coulter used to be closed for months in 1950s.
43. Our neighborhood floods severely, funding is not available for drainage so we need drainage utility.
44. Do we need to revise standards for new developments?
    a. Designs are by PE.
    b. Currently have minimal standards, standards will raise cost of development.
45. Fulton Creek condition caused long after development of Paramount Terrace and Ridgecrest.

Appendix 14C

Sign-In Sheets

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 11, 2012 at 7:00 PM

Emerson Elementary: 600 N. Cleveland

1. NAME Wesley Green
2. NAME Delores Thompson
3. NAME John Tucker
4. NAME Jim Lawson
5. NAME Edward Maxey
6. NAME Mark Maxey
7. NAME Mark Reed
8. NAME Lu R. Kayahphu
9. NAME Becky Hill
10. NAME
11. NAME
12. NAME
13. NAME
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32. NAME

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 11, 2012 at 7:00 PM

Emerson Elementary: 600 N. Cleveland

1. NAME Kevin Brown
2. NAME Eddie Weld
3. NAME Ruth Weld
4. NAME Kevin Ward
5. NAME Vicki Lowery
6. NAME Alan Abraham
7. NAME Joyce Hinsley
8. NAME Robert Goodrich
9. NAME
10. NAME
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32. NAME

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 12, 2012 at 7:00 PM

Tradewinds Elementary: 4300 Williams

1. NAME
2. NAME Paul Hargale
3. NAME Ted Adm
4. NAME Kevin Welch
5. NAME Risa Mullin
6. NAME Connie Neely
7. NAME Jodi Maner
8. NAME
9. NAME
10. NAME Robert Goodrich
11. NAME
12. NAME
13. NAME
14. NAME
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32. NAME

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 12, 2012 at 7:00 PM

Tradewinds Elementary: 4300 Williams

1. NAME Clarence R Williams

2. NAME Marilyn D. Williams

3. NAME

4. NAME

5. NAME

6. NAME

7. NAME

8. NAME

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32. NAME

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 12, 2012 at 7:00 PM

Tradewinds Elementary: 4300 Williams

1. NAME J D Neely

2. NAME Lonnie Neely

3. NAME

4. NAME

5. NAME

6. NAME

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32. NAME

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 12, 2012 at 7:00 PM

Tradewinds Elementary: 4300 Williams

1. NAME Bud Cochran
2. NAME Ted Lock
3. NAME Charlene Lock
4. NAME Michael Rice
5. NAME
6. NAME
7. NAME
8. NAME
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31. NAME
32. NAME

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 18, 2012 at 7:00 PM

San Jacinto Elementary: 3400 West 4th Avenue

1. NAME Mary Ruth Hefley
2. NAME Ralph Hillsinn
3. NAME Marilyn Hillsinn
4. NAME Ted Lock
5. NAME Charlene Lock
6. NAME Emma Heidebrecht
7. NAME Roy McDowell
8. NAME
9. NAME Cathy Revell
10. NAME Tim Revell
11. NAME Jim Parker
12. NAME Jim Simms
13. NAME E W Bujan
14. NAME David T. Horsley
15. NAME J. ATKINSON
16. NAME Les Hoyt
17. NAME Susan Buja
18. NAME Jennifer B. Waters
19. NAME Kelly Burkham
20. NAME
21. NAME
22. NAME
23. NAME
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29. NAME
30. NAME
31. NAME
32. NAME

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 19, 2012 at 7:00 PM

Puckett Elementary: 6700 Oakhurst

1. NAME Bon Womack
2. NAME
3. NAME
4. NAME Robert Goodrich
5. NAME Constance Ditto
6. NAME William Ditto
7. NAME Margaret Heyde
8. NAME David Kilpatrick
9. NAME William Summerford
10. NAME Bill Wolfe
11. NAME D'Mard Hemphill
12. NAME Becky Hill
13. NAME
14. NAME Jim Reid
15. NAME
16. NAME Nicolas Canales
17. NAME
18. NAME
19. NAME
20. NAME
21. NAME David Moore
22. NAME Lisa Brown
23. NAME
24. NAME Danny South
25. NAME
26. NAME
27. NAME
28. NAME
29. NAME
30. NAME
31. NAME
32. NAME

PUBLIC MEETING
FOR
PROPOSED STORM WATER DRAINAGE UTILITY

January 19, 2012 at 7:00 PM

Puckett Elementary: 6700 Oakhurst

1. NAME MIKE LAW
2. NAME HOWARD Smith
3. NAME Carol Smith
4. NAME Kimberly Puckett
5. NAME
6. NAME
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Appendix 14D

City Website Content

City Internet Web Site Content

City of Amarillo Drainage Utility Study

Why is the Drainage Utility being considered?

Amarillo has extensive stormwater drainage management needs as most recently evidenced by the large number of citizen drainage problems reported during 2010. City funding for drainage management does not currently meet community needs. Historically, the City has relied on the General Fund to support the construction of projects to reduce flooding and for maintenance of drainage infrastructure such as storm drain systems, ditches/channels, and roadway culverts. Each year, the City's drainage management program competes with other general government activities for the limited General Fund capital resources. In other words, the available funds are allocated to priority projects that include many items of essential basic infrastructure. Often, drainage projects are unable to be fully funded due to other needs and limited funds.

A Drainage Utility, such as is being considered, is a user-fee based funding program for municipal drainage management. This is a common funding mechanism throughout Texas and the funds are dedicated only to appropriate drainage and drainage management projects. The City is evaluating a Drainage Utility to ensure that stable funding for drainage management activities are available. Evaluation of a Drainage Utility was identified several years ago with the Development Policy Review Committee and was further identified in the City of Amarillo's recent Comprehensive Plan process. Since that time, the City has retained a professional consultant to further the evaluation, presentation and consideration of the Utility.

As an example of the system needs that could be addressed by a Drainage Utility, please consider that there are fifty-five (55) currently identified drainage improvement projects for which preliminary engineering evaluation and cost estimation have been completed. The total design and construction costs for these projects is $66,000,000. The lack of dedicated funding has severely limited implementation of these identified capital improvement projects.

The City's drainage system now includes over 180 miles of storm drain pipe and roadway culverts, 15 miles of constructed ditch/channel, and over 3,300 curb inlets. There is a need for a proactive, dedicated maintenance program that includes: 1) infrastructure evaluation to determine structural condition, 2) replacement/rehabilitation (before failures such as a pipe collapse) and 3) regular removal of debris, sediment, trash, and vegetation.

A Drainage Utility Study has been underway since May 2011 to: 1) assess the City's funding needs for flood reduction construction projects and for an improved drainage infrastructure operations and maintenance program, and 2) to establish potential Drainage Utility customer monthly billing rates required to support the City's drainage management program funding needs to provide better life safety and property protection drainage services.

City staff and the consulting team presented the potential Drainage Utility to the City Commission in 2011 for their initial review. At this point, it is being presented to the community for information, and to receive public comment and input.

Meetings

We look forward to your attendance and participation in the public meetings below.

January 2012 Public Meetings-Come to Learn and Give Your Input

Public Meetings will be held in January 2012 to provide information on proposed Drainage Utility user-fees and improved drainage services. Public comment at these meetings will be summarized and provided to the City Commission for consideration in determining if the Drainage Utility is appropriate for the City of Amarillo.

Date	School Location	Address
Wednesday, January 11 - 7PM	Emerson Elementary	600 N. Cleveland
Thursday, January 12 - 7PM	Tradewind Elementary	4300 Williams
Wednesday, January 18 - 7PM	San Jacinto Elementary	3400 W. 4th Avenue
Thursday, January 19 - 7PM	Puckett Elementary	6700 Oakhurst

Drainage Utility FAQ's

The City is considering the implementation of a Drainage Utility to provide improved funding for the City's drainage management program to reduce the frequency and magnitude of flooding conditions throughout the City. The following information is provided to answer the most common questions associated with Drainage Utility implementation.

- 1. What is a Drainage Utility?
- 2. What are Drainage Utility fees based on?
- 3. How is the Drainage Utility fee determined?
- 4. What is the fee structure?
- 5. How much is the fee?
- 6. How will the fee be collected?
- 7. What will customers receive for their monthly fee?
- 8. Will the Utility solve all of the drainage problems in Amarillo?
- 9. When will the fee go into effect?
- 10. Can I request a review of my drainage fee?

1. What is a Drainage Utility?

A Drainage Utility is a user-fee based funding mechanism for municipal drainage management services. The fee is proportional to service demand similar to municipal water, wastewater, and solid waste services. The two major advantages over continued reliance on monies from the General Fund for drainage services are: 1) the establishment of a dedicated, long-term funding stream specifically for drainage management and 2) customer fee equity.

There are over sixty (60) municipal drainage utilities in the state of Texas. Drainage Utility implementation and operation are governed by State laws. Drainage Utility revenue must be managed in a protected account and can only be used for drainage management purposes.

2. What are Drainage Utility fees based on?

Fees are assigned to property parcels based on storm-water runoff characteristics, not property value. Because the placement of impervious cover on land, such as rooftops, driveways, walkways, and parking areas, increases both the flow rate and volume of stormwater runoff; it is the single most significant land use characteristic in terms of demand placed on drainage infrastructure systems to convey stormwater runoff flows. Therefore, the amount of impervious cover is used to assign Drainage Utility fees to all developed properties, both residential and commercial, within the City.

3. How is the Drainage Utility fee determined?

The monthly fee is based on the amount of impervious surface area on each developed land parcel in the City. Impervious surfaces such as rooftops, driveways and parking areas impede natural infiltration, and increase the rate and volume of stormwater runoff that must be collected and carried by the City's drainage system. The impervious area for each developed property parcel was estimated from Potter-Randall Appraisal District records on building features and parking areas and aerial photographs of the City. The average impervious area for single-family property in Amarillo is 2,800 square feet. This average will be the standard Equivalent Residential Unit (ERU) used for the commercial property classification.

4. What is the fee structure?

Based on evaluation of impervious area (IA), a three-tiered rate structure was developed for single-family properties. The "Small" and "Large" classifications each represent twenty-five percent of the total number of parcels in the City. The "Typical" classification represents the middle fifty percent of parcels in the City.

Single-Family Classification

Classification	Equivalent Residential Units	Impervious Area
Small	0.68 ERU	up to 2,072 square feet
Typical	1.0 ERU	2,072-3,236 square feet
Large	1.5 ERU	greater than 3,236 square feet

Duplex-fourplex, condominium, and mobile homes not in commercial parks are assigned the "Small" classification for each dwelling unit.

Commercial classification properties are assigned fees based on the number of Equivalent Residential Units of impervious area on the property parcel.

Commercial Classification

Number of ERUs = Impervious Area/2,800 square feet (minimum 1.0 ERU)

The Commercial classification includes commercial, industrial, multi-family apartments, commercial mobile home park, City, County, school district, and religious properties.

Exemptions

State law exempts the following properties from Drainage Utility fees:

- State of Texas
- Institutions of higher learning
- Undeveloped property
- Properties with private drainage system* (No discharge to a waterway, roadway, or other City drainage infrastructure)

**On-site drainage infrastructure such as detention ponds, channels, pipes, and culverts do not constitute a "private drainage system" if stormwater runoff leaves the property boundary and enters the City's drainage system.*

5. How much is the fee?

The monthly billing rate will be $2.51 per ERU. The fee will remain at this level for at least 5 years. The City Commission will review Drainage Utility progress as part of the annual budget process.

Property Classification	Monthly Fee
Small Residential	$1.71
Typical Residential	$2.51
Large Residential	$3.79
Commercial	$39.15 / acre impervious area (43,560 square feet)

6. How will the fee be collected?

The fee will be included on the City's monthly utility billing statement along with water, wastewater, and solid waste collection fees.

7. What will customers receive for their monthly fee?

The revenue from this new fee will enable the City to fund $12,000,000 in drainage management construction projects that have been on hold and will support an improved, dedicated operation and maintenance program for proactive cleaning and rehabilitation/replacement of the aging drainage infrastructure system.

8. Will the Utility solve all of the drainage problems in Amarillo?

The City plans to systematically address existing drainage and water quality problems as well as establish improved design standards for future drainage infrastructure. However, the City cannot afford to immediately fund solutions for all of the known problems. Priorities will be established by the City Commission, and the timing for the start of individual projects will be based on revenues collected and other financial factors that must be considered.

9. When will the fee go into effect?

If approved by the City Commission, the fee will be effective with the October 2012 City utility billing statement. In August, a sample bill will be mailed out to allow customer review and any City adjustment before the first billing scheduled for October.

10. Can I request a review of my drainage fee?

If you believe that your fee is in error, there will be an appeal process whereby the customer can bring forward information on impervious area, land use, or private drainage system for City consideration for fee adjustment.

Data Appendix