



2015

Water Agency

Zones 11A, 11B, and 11C

FEE PLAN

Engineer's Report

EFFECTIVE DATE: 2015

Sacramento County Water Agency Code

Zone 11A, 11B, 11C Fee Plan and Engineer's Report

On April 14, 2015, by Resolution Number WA-2898, the Board of Directors of the Sacramento County Water Agency, a statutorily created district operating under the authority of and pursuant to the provisions of the Sacramento County Water Agency Act (California Water Code, Appendix, Chapter 66, commencing at Section 66-1 et seq.), adopted the 2015 Zone 11A, 11B, 11C Fee Plan and Engineer's Report, thereby replacing the previous 2004 Fee Plan and Engineer's Report (established by Resolution Number WA-2543).

SACRAMENTO COUNTY WATER AGENCY

RESOLUTION NO. WA-2898

**SACRAMENTO COUNTY WATER AGENCY DRAINAGE FEE
ZONES 11A, 11B, 11C FEE PLAN UPDATE**

WHEREAS, the Zone 11 regional drainage impact fee program was initiated in 1965; and

WHEREAS, Zones 11A, 11B, and 11C were established in 1996 as separate zones of the Sacramento County Water Agency ("Agency") to, in part, prepare and adopt fee plans for the improvement and construction of drainage facilities necessitated by the development and new construction of property, collect such fees, and thereby construct drainage facilities; and

WHEREAS, the Sacramento County Water Agency Code requires a Fee Plan for each zone, and a Fee Plan for Zones 11A, 11B, and 11C has been enacted since 1996, as revised from time to time; and

WHEREAS, Section 66000 et seq., of the California Government Code requires any action establishing, increasing, or imposing a fee as a condition of approval of a development project by a local agency do the following: 1) identify the purpose of the fee, 2) identify the use to which the fee will be put, 3) determine how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed, and 4) determine how there is a reasonable relationship between the amount of the fee and the cost of the public facilities on which the fee is imposed; and

WHEREAS, the Agency Engineer has revised and updated the fee plan for Zones 11A, 11B and 11C of the Agency, entitled Fee Plan Sacramento County Water Agency Engineer's Report For Zones 11A, 11B, and 11C ("Fee Plan") as required by law; and

WHEREAS, Section 66000 et seq., of the California Government Code requires the local agency to hold a noticed public hearing, at which oral or written presentations can be made, prior to the adoption of a new fee or increasing an existing fee; and

WHEREAS, on March 10, 2015, the Agency Board of Directors ("Board") commenced a properly noticed public hearing to revise the Zone 11A, 11B, and 11C drainage impact fees as detailed in the Fee Plan; and

WHEREAS, all written and oral presentations have been duly considered by the Board; and

WHEREAS, the proposed revised fees contemplated by the Fee Plan shall take effect 60 days after approval by the Board.

NOW, THEREFORE, BE IT RESOLVED AND ORDERED by the Board:

1. The above recitals are true and correct, and the Board so finds and determines.
2. The Board finds and determines that:
 - a. The development of property within Zones 11A, 11B, and 11C will require the construction of additional facilities described in the Fee Plan because existing facilities in said zones are inadequate to support development and new construction on property within the zones; and
 - b. The use of the fees as set forth in the Fee Plan is to fund construction of drainage facilities necessitated by development and new construction on property within the zones; and
 - c. The fees set forth in the Fee Plan are reasonably related to and fairly apportioned within each of Zones 11A, 11B, and 11C based on the benefits conferred on property proposed for development served by the drainage facilities or on the need for aforesaid facilities created by proposed development or new construction within each zone; and
 - d. The fee as to any property proposed for development within each of Zones 11A, 11B, and 11C does not exceed the proportionate share of the amount of the total estimated costs of all facilities within each of said zones which would be assessable on such property if such costs were apportioned uniformly on a per acre basis; and
 - e. The facilities planned are in addition to existing facilities serving the zones; and
3. The content and findings of nexus contained within the Fee Plan for Zones 11A, 11B, and 11C are adequate to fulfill the requirements of California Government Code 66000, et seq. and the Sacramento County Water Agency Code; and
4. The Sacramento County Water Agency's Fee Plan and Engineer's Report for Zones 11A, 11B, and 11C are hereby adopted, and the fees set forth therein-effective May 9, 2015.

On a motion by Director Nottoli, seconded by Director Serna, the foregoing Resolution was passed and adopted by the Board of Directors of the Sacramento County Water Agency, a statutorily created district operating under the authority of and pursuant to the provisions of the Sacramento County Water Agency Act (California Water Code-Appendix, chapter 66, commencing at section 66-1 et seq.), this 14th day of April, 2015, by the following vote, to wit:

AYES:	Supervisors,	Kennedy, MacGlashan, Nottoli, Peters, Serna
NOES:	Supervisors,	None
ABSENT:	Supervisors,	None
ABSTAIN:	Supervisors,	None



Chair of the Board of Directors of the Sacramento
County Water Agency, California



In accordance with Section 25103 of the Government Code
of the State of California a copy of the document has been
delivered to the Chairman on 4-14-15

By: S. Studdert
Deputy Clerk, Board of Directors

ATTEST: Cyndi Lee
Clerk of the Board of Supervisors of Sacramento County, California and Ex Officio Secretary of
the Board of Directors of the Sacramento County Water Agency

FILED
BOARD OF DIRECTORS

APR 14 2015

BY Cyndi Lee
CLERK OF THE BOARD

[insert Resolution WA-_____, dated _____, 2015]

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2015 DRAINAGE IMPACT FEE PLAN for ZONES 11A, 11B and 11C

BACKGROUND

This Fee Plan is drawn pursuant to the Water Agency Code, Title 2, specifically, Sections 2.25.020 and 2.25.040, Content of the Fee Plan and Requisite Findings, respectively. The Fee Plan is to be reviewed and adjusted as necessary and periodically, pursuant to Section 2.25.060. This Fee Plan supersedes the 2004 Fee Plan. Where Conflict may arise, the Water Agency Code shall take precedence.

The Sacramento County Department of Water Resources (DWR) is currently revising the drainage fee for Zones 11A, 11B, and 11C. The purpose of this document is to provide the basic assumptions used in developing the fee and the fee rate structure.

Periodic Fee Revision

The assumptions and methods used in calculating the new drainage fee are based on the best available information. As future development occurs in each Zone, and master plan improvements are implemented, the fee may be periodically revised based on updated information in order to keep the fee as current as possible.

Zone 11 History

Zone 11 of the Sacramento County Water Agency was originally formed in April 1965 with the purpose of providing funding for the construction of major drainage facilities. The area within Zone 11 includes the urbanized and urbanizing areas of the unincorporated portions of the County. All development that contributes to storm water runoff (intensity and/or volume) is required to pay a drainage impact fee to offset the cost of trunk and regional drainage facilities necessitated by development.

Computations were made, in the 1965 study, to determine the average cost of constructing drainage facilities. These costs were based on the type of construction prevalent at the time, primarily pipe and trapezoidal concrete-lined open channels. The total cost of such facilities within Zone 11 was estimated, and a per acre cost was determined. The per acre cost varied for different types of development based on average percent of impervious area. Development was broken into three categories: residential, commercial, and parks.

The fee is adjusted annually, based on the Engineering News Record's Construction Cost Index, to account for inflation of construction costs.

In April 1990, a 15% increase in the drainage fee was approved by the Board to allow for the increased drainage facility construction required for environmental mitigation, including additional channel excavation due to wetlands mitigation, and to mitigate some determined cumulative impacts of urban drainage on downstream properties.

The Fee Plan was revised in 1996 to create Zones 11A, 11B, and 11C and to account for the 1996 City/County of Sacramento Hydrology Standards and to add additional drainage components common to development, including:

- Flood control detention (local and regional peak flow)

- Water quality facilities (such as detention)
- Environmental mitigation and monitoring
- Master planning costs, including wetlands delineation
- Limited property acquisition
- Upsizing bridges and large culverts for ultimate capacities

Revisions in this 2015 Fee Plan included an analysis of Zone 11 trunk drainage facilities as described in the drainage master plans for current and recent specific plan areas. A questionnaire was sent out to several developers, engineers, and construction companies to review the unit prices paid for items of work on an expanded Schedule D (Appendix 2). The broad categories, over which the updated Schedule D unit prices were applied, include:

- Closed Conduit (Pipes)
- Channel Excavation
- Basin Excavation
- Basin Real Estate
- Channel Crossings
- Utility Relocation

In September 2014, the Department of Water Resources received responses from developers and engineers commenting on the trunk drainage unit prices on Schedule D. The basis of this 2015 update to the Fee Plan is an adjustment to those unit prices applied to the trunk drainage item list developed for each of the fee zones.

Plan review labor, legal services, consultants and other overhead costs were reviewed and averaged for fiscal years 2004 through 2007, a time when development activity was vibrant.

Fee Zones

Zones 11A, 11B, and 11C (see map, Figure 1) are intended to account for the variability of facilities required within different major watersheds, due primarily to topography and the existence of natural streams versus man-made channels.

The boundaries of each Zone are based on major watershed boundaries. Within each Zone there is a constant fee, regardless of any specific differences in facility needs of the smaller sub-sheds within that Zone. For example, although some sub-sheds may require flood control detention while other sub-sheds do not, the same fee will be required throughout the Zone and regional nexus is found in the fact that each development, whether upstream or downstream, contributes to drainage and requires functioning storm drainage systems to facilitate regional road travel and transportation. The Zones 11A, 11B and 11C are described as follows:

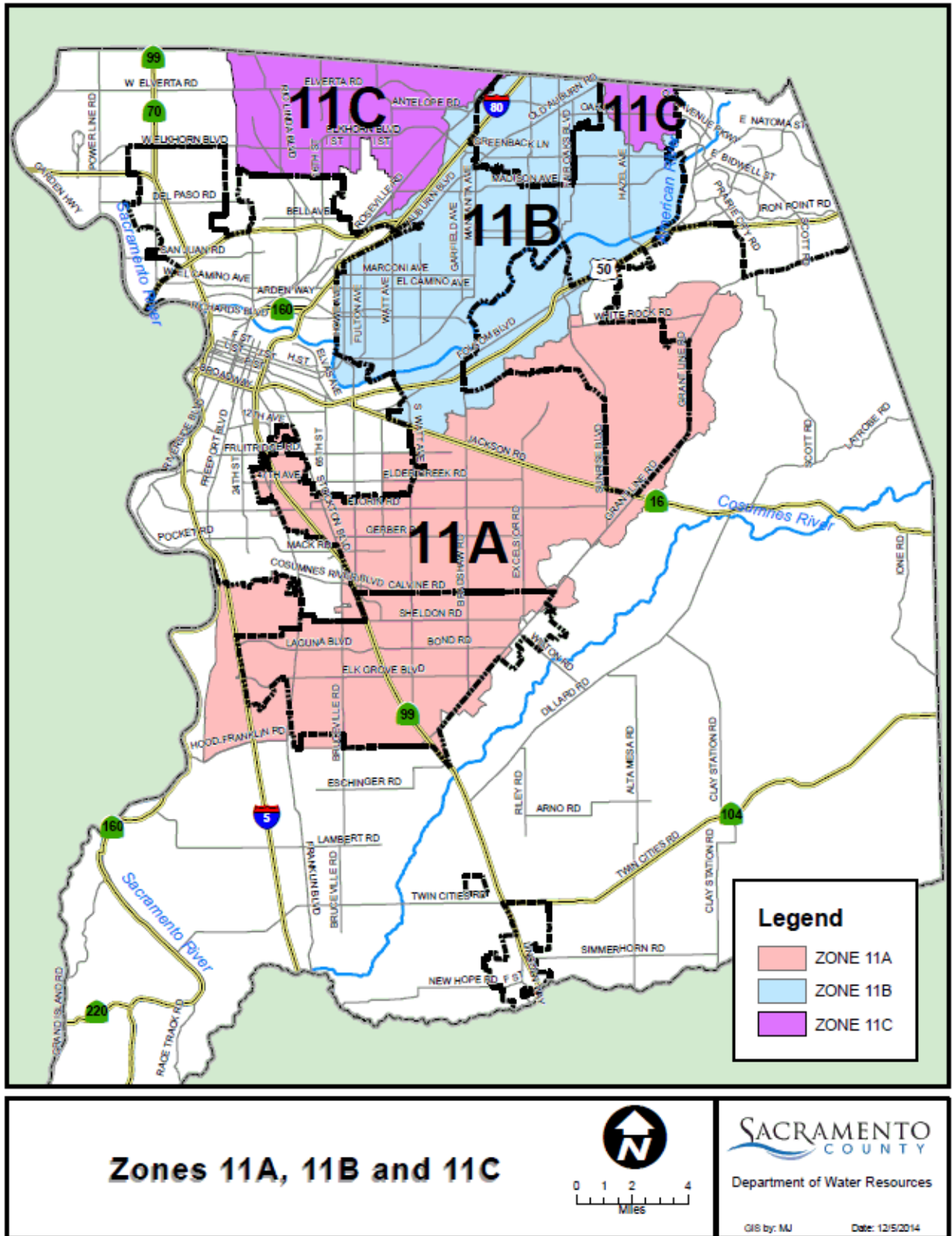
1. Zone 11 A - Morrison Creek stream group and watersheds draining to the Beach Stone Lake region.
2. Zone 11 B - American River tributaries and Arden/Arcade watersheds
3. Zone 11 C - Dry Creek and tributaries and watersheds draining to Steelhead Creek (aka. Natomas East Main Drainage Channel).

Zones 11A, 11B, and 11C are regional and overlap the political boundaries of the Cities of Citrus Heights, Rancho Cordova, and Elk Grove. The fees for each Zone are collected and

administered by the Sacramento County Water Agency. Each Zone has a separate budget account and the funds are not co-mingled.

The fee program for each Zone is a stand-alone program for the purposes of constructing trunk drainage in that Zone in accordance with Title 2. Developing property in each Zone is benefitted by the fee as either the beneficiary of credits for construction of drainage facilities or the user of the trunk drainage facilities within the Zone.

FIGURE 1
Sacramento County Fee Zones



Development Classifications and Component Impacts

There are three basic trunk drainage components: pipes, channels and basins. For purposes of assessing the drainage impact fee, the contribution to the need for each trunk drainage component was considered for a nominal development of various density and corresponding percentage of impervious area. These results were plotted creating a continuum for setting fees for any specific project based on the impervious area of that project.

There will continue to be a different fee for each land use; however, the distinctions are revised (from the 1996 Fee Plan) to reflect the way that increased impervious area impacts (per County Hydrology Standards) the drainage facilities. An effort is made to simplify the method for determining site specific impervious area and the fee is set based on the outcome of this calculation. This is of particular importance in the case of parks and schools for which the impervious area may vary widely. It also creates an incentive for a park, school, and commercial projects to reduce drainage impacts in order to enjoy some relief in the fee charged.

DRAINAGE FEE CALCULATION

The drainage fee for each Zone is based on the estimated drainage credits that will be given for installation of trunk drainage facilities, plus engineering, administration, and contingency. The fees and credits will not zero balance on a project by project basis or a year by year basis, rather, the immense infrastructure required to safely convey storm water, flood water and to achieve the goals of the Clean Water Act are estimated over the entirety of each Zone.

Specifically, the fee was determined based on:

1. Trunk drainage facilities estimates, including size and quantity, for each Zone. For Zones 11A and 11C, the estimates were derived from current drainage master plans and specific plan areas. For Zone 11B, the estimate was derived by carrying forward the regional analysis used in the 1996 Fee Plan.
2. Trunk drainage facility unit prices (Schedule D), which were updated based on a survey sent out to various developers, engineers, and contractors.
3. Land use information, based on an average of built areas, provided by the Planning Department (see Table 2).
4. The impact of each land use, percent impervious area, using the Hydrology Standards, HEC-1 software, and the Improvement Standards.
5. Administrative costs such as consulting engineering, external expenditures, Water Resources Department labor, storm water pollution prevention program and minor drainage review labor, National Pollutant Discharge Elimination Program labor, and other County labor.

The effective percent impervious area of a site is primarily related to land use; that is, it is assumed that building on the parcel will complete over time to account for the percentages listed in the table below. Therefore, actual calculations of percent impervious area should only be necessary for land uses not listed in Table 1.

Rainfall can infiltrate, evaporate, transpire, or run-off. Drainage facilities are designed based on estimation of run-off flows using computer modeled design storms. The

Sacramento County Improvement Standards and the City/County Hydrology Standards provide a method for designing pipes, channels, and detention basins based on effective percent impervious area for various land use. Trunk drainage facilities are required to convey and control runoff from developments that increase percent impervious area, thus, the basis for fees shall be effective percent impervious area.

Effective increase in percent impervious, since 1965 implementation of the Zone 11 program, as follows:

TABLE 1 Land Use versus Effective Percent Impervious

(Adapted from Table 5-3 of the Sacramento City/County Hydrology Standards- Volume 2 provides, where du/ac is dwelling units per acre)

Land Use	Effective Percent Impervious
Highway/Parking	95%
Commercial / office / retail	90%
Industrial	85%
Apartments 31+ du/ac	80%
Mobile Home Park	75%
Apartment/Condo (13-30 du/ac)	70%
Residential 8-10 du/ac	60%
Residential 6-8 du/ac	50%
Residential 4-6 du/ac	40%
Residential 3-4 du/ac	30%
Residential 2-3 du/ac	25%
Residential 1-2 du/ac	20%
Mowed grass with graded and piped to drain	20%
Residential 0.5-1 du/ac	15%
Residential 0.2-0.5 du/ac	10%
Park without piped drainage	10%
Residential <0.2 du/ac	5%
Open Space	2%

When calculating drainage fees, the following special considerations may apply:

- Traditional school and church campus developments may be treated as 50% impervious

area so that they may pay one fee allowing them to build and rebuild without further fee collection.

- No fee is charged for areas encumbered by open space, creeks, bio-swales and detention basins.

Typical Development

The Sacramento County Planning Department provided information on typical zoning for built-out areas countywide (Table 2). This information is used to determine the average impervious area and to adjust for the impact in each Zone of the development types and their related impact on the trunk drainage facilities.

TABLE 2 Typical Zoning In Built-Out Areas Countywide

Approximate Acres of Zoning (Unincorporated County, Elk Grove, and Citrus Heights) (1)

	Acres	% of Total	% impervious area	% land use	Determine Average Impervious Area (3)
RD 1-3					
RD 1	466.90				
RD 2	5342.78				
Total	5809.68	9.20%	20%	9.20%	1.84%
RD 3-5					
RD 3	2958.49		30%	4.68%	1.41%
RD 4	3288.98		40%	5.21%	2.08%
RD 5	29159.39		40%	46.17%	18.47%
Total	35406.86	56.06%			
RD 5-7					
RD 7	2884.71		50%	4.57%	2.28%
Total	2884.71	4.57%			
RD 15 - 40 (2)	3861.09	6.11%	70%	6.11%	4.28%
Commercial/Park and Open Space					
Commercial	6715.90	10.63%	90%	10.63%	9.57%
Park/Open Space	8482.13	13.43%	15%	13.43%	2.01%
Grand Total	63160.37	100.00%		100.00%	41.9 4%

- 1) Acreage totals do not include parcels that have more than one zoning (RD 00, Z 00 parcels) nor does it include parcels in Special Planning Areas (SPA)
- 2) Acreage include single-family houses
- 3) Determined percent land use from the acreages listed in the second column and multiplied by the percent impervious area. The sum of this column equals the weighted average percent impervious area.

Source of first three columns: Tim Kohaya, Sacramento County Planning Dept.- February 2003

The basic components of the Fee Plan include:

- Closed Conduit (Pipes)
- Channel Excavation
- Basin Excavation
- Basin Real Estate
- Railroad Bridges and Over-chutes
- Utility Relocation
- Engineering
- Zone Administration
- Contingency, Interest, In-fill Absorption

Credits for Construction of Trunk Drainage

The overall intention of the trunk drainage fee and credit program is to compensate developers for installing facilities that serve their neighbors. The credits are not intended to fully compensate developers for the drainage facilities presuming that every development would need to establish a drainage system. It is in the best interest of the community to develop drainage systems that are master-planned for the watershed, not merely the interest of an individual development. Consequently, partial compensation for trunk drainage has been the standard for the Agency since 1965.

Minor drainage systems serve less than 30-acres of watershed and trunk drainage serves more than 30-acres. This program intentionally offers no credits for minor drainage of any sort.

Measurement and Payment of Credits

All credits shall be allocated and managed pursuant to Chapter 2.55 of Water Agency Code, Title 2. Where conflicts arise the Water Agency Code shall take precedence.

- a) Trunk drainage pipe will be paid by as-built measured lineal foot from center of junction structure or manhole, at the unit prices listed in Schedule D, which includes excavation, traffic control, shoring, bedding and backfill.
- b) Four inch thick concrete channel lining shall be paid at the unit price listed in Schedule D. If the design thickness is different than 4", the revised unit price shall be calculated and paid. That is, a 5" thick lining shall be paid at 125% the price listed per as-built measured square foot. The unit price includes rebar, wire mesh, grading, and all leveling material (aggregate base rock and sand) under the slab.
- c) Three foot post and cable fence shall be paid per as-built measured lineal foot at the unit price listed in Schedule D, which includes a complete fence.
- d) Pipe gate shall be paid at the unit price per each as listed in Schedule D. This assumes a pipe gate with three or four pipes of 15 foot width and shall be adjusted based on as-built post to post width. For example, an 18 foot wide gate shall be paid at 120% the price listed.

- e) Six foot high chain-link fence shall be paid per as-built measured lineal foot at the unit price listed in Schedule D, which includes a complete fence. If the fence is more or less than 6 feet high, the price shall be adjusted. That is, an 8' high chain-link fence shall be paid at 133% of the price listed.
- f) Six foot high chain-link gate shall be paid per each at the unit price listed in Schedule D, which includes a complete fence. This is for a gate width, measured post to post, of 16 feet. If the width is different, the unit price shall be adjusted. That is a 12 foot wide gate shall be at 75% of the unit price listed.
- g) Signs required by the Department of Water Resources, or a state or federal resource agency, shall be paid per as-built measured square foot sign face area, at the unit price listed in Schedule D, which includes a complete sign. There are two prices: for 16 square feet or smaller and for signs that are larger than 16 square feet.
- h) Miscellaneous metal, such as: handrails, access racks, debris racks, flap gates shall be paid per as-built calculated weight per unit price listed in Schedule D. This information should come in the form of an initial estimate based on the density of the metal and verified by a receipt or invoice from the vender, or other method of checking the weight of material used. Nuts and bolts and minor appurtenances are included in the unit price, and not included in the weight paid. Manhole rims and lids are not miscellaneous metal.
- i) Channel excavation shall be paid by as-built measured cubic yard (neat line per the plans) at the unit price listed in Schedule D. Volume can be calculated manually by average end cross section or by digital methods. The same unit price is paid for short haul scraper excavation and for long haul truck export. The original ground for use in determining the excavated quantity shall be the lowest of either the existing ground or the finish development grade.
- j) Basin excavation shall be paid by as-built cubic yard at the unit price listed in Schedule D. This can be done manually by average end cross section or by digital methods. The same unit price is paid for short haul scraper excavation and for long haul truck export. The original ground for use in determining the excavated quantity shall be the lowest of either the existing ground or the finish development grade.
- k) Erosion control rip-rap shall be paid per as-built ton placed neatly per the approved plans at the unit prices listed on Schedule D. Estimate of tons of rip-rap can be done based on specific gravity and neat lines on plans. The tons shall be verified by weigh slips, if this amount varies from the estimated amount, field measurements to assure that the construction approximates the neat line approved drawings may be required.
- l) Access ramps, driveways and maintenance road materials: structural sections of asphalt concrete on aggregate base rock, aggregate base rock alone, decomposed granite, and geotextile fabric shall be paid per as-built square feet at the unit price listed on Schedule D, which includes all appurtenances and no additional compensation shall be allowed.
- m) Repairing asphalt concrete surfaces shall be paid per as-built quantities and the unit prices listed in Schedule D. Asphalt concrete patching shall be paid at the listed unit price per square foot regardless of thickness, saw cutting, temporary cut back, trench

plates, trench guarantee requirements or traffic control. The measured quantity shall be the t-trench width per the Construction Specifications. This item is only paid when the patch paving is the final accepted product. That is, if the existing asphalt concrete is to remain, patch paving is to be done, and the surface is overlaid or slurry sealed, patch paving shall be credited. However, if the surfacing is removed for a greater width than the trench patch, due to requirements of the inspector or others, patch paving credit shall not be allowed.

- n) Repair of concrete sidewalks, curbs and gutters is not credited.
- o) Hydroseeding shall be paid per as-built measured area, top of bank to top of bank of the drainage channel only, at the unit price listed on Schedule D.
- p) Miscellaneous concrete shall be paid per the as built calculated cubic yard at the unit price listed on Schedule D, and includes (without additional allowance) all rebar, excavation, grading, rock and sand base, and backfill. Miscellaneous concrete is paid in two broad categories: formed structures (junction boxes, headwalls, box culverts, and stairways) and flat work (flat pads, driveways, and weirs). The listing of these items does not infer that they are necessarily creditable. For example, if non trunk drainage pipes coming to a junction with the trunk pipe system create the need for a junction box, the credit shall be the least expensive of the junction box or a manhole that hypothetically would have been used if it were not for the non-trunk pipes. Note that box culverts are almost always paid by the funding mechanism that is construction the roadway and not the Water Agency.
- q) Under unusual circumstances trunk drainage construction not listed on Schedule D may be required on the approved improvement plans, in those cases the Board of Directors may authorize credits based on adequate justification of price. Refer also to the appeals process, chapter 1.15 of title 1. Unusual circumstances of construction may not include: construction of minor drainage, construction costs differing from Schedule D, traffic control, excavation depth, shoring, repair of surfaces, trench cut fees, environmental mitigation, pump stations, nor interaction with property owners.
- r) Acquisition of basin real estate shall only be allocated credits in accordance with Title 2 and as follows:
 - i. The basin is deemed to be regionally beneficial for flood control meaning:
 - 1. Mitigating upstream proposed development and/or correcting existing downstream flooding problems identified in an approved drainage master plan; and
 - 2. Typically having a side channel weirs adjacent to the channel from which peak flow is to be attenuated by the basin.
 - ii. When the basin is also used for stormwater quality treatment, the basin land credit will be adjusted to the minimum size necessary for the flood control benefit; and
 - iii. The value will be determined per Section 2.40 and is necessarily limited by the amount estimated in this fee plan.
 - iv. The Agency is under no obligation to acquire land, and shall only act as a willing buyer when determining the credit agreement value.
 - v. There is no land value credits available for stormwater basins or 'hydromod' basins.

- vi. For combined basins with regionally beneficial flood control, the real estate credit is calculated based on a theoretical stand-alone flood control basin.
- s) Items that are expressly not creditable, thus not included in the fee plan, are wetland mitigation, real estate except as stated above, and new pump plants.

Annual Adjustment of the Fee Schedule “A” and Credit Schedule “D”

The calendar year 2014 construction cost index (CCI) will not be added to the fees and credits, instead this update will suffice and the 2015 CCI will be added in early 2016 in accordance with sections 2.50.080 and 2.55.060 of title 2.

ZONE 11A

Several drainage master plan areas, totaling 7135 acres were considered in updating this Fee Plan and a tabulation of the trunk drainage facilities was compared to the updated Schedule D unit prices. Drainage studies are constantly revising as better detail of the needs for each development plan are known, but the overall average fee component method used in the 2004 Fee Plan has served well and in general is continued in this update.

Zone 11A Cash Flow

Accounting for Zone 11A occurs in Fund 315A. The fund is healthy and has been able to pay its reimbursement obligations. This Zone is the fastest growing area of the County. The following tables and chart are based on current assumptions of development in master planned growth areas.

Planning areas considered in developing the fee study include:

- North Vineyard Station having an approved Clean Water Act permit for construction of Elder Creek and Gerber Creek, through 2018. Consequently, the credit/reimbursement estimate is heavily loaded between 2014 and 2018.
- Vineyard Springs will construct improvements on upper Gerber Creek anticipated in the early years of the projection.
- Developers are active in the City of Elk Grove.
- Florin Vineyard Gap development on Elder Creek, Florin Creek and Unionhouse Creek watersheds will include detention, trunk pipes and channel improvements.
- Newbridge, Jackson Township and Mather South are in the planning stage anticipating development interest in coming years.

West Jackson is a plan to redevelop the mining pits on Morrison Creek and is not included in the projection because of potential mining reclamation exemption in 2.50.060.

Appendix 6 describes the Zone 11A projection of revenue and expenses as one considers groundbreaking on these planning areas. It is assumed that the master developer for each of the planning areas will begin work with heavy front end trunk drainage costs. In later years those plan areas should fill in with development paying cash fees.

Fee Plan for Zone 11A - Components

Closed Conduits (Pipes)

1. The trunk pipe facilities for several specific plan areas were compared with the new Schedule D credit unit prices to determine this component of the fee plan.
2. Additionally, pipe sizes are increased in Zone 11A due to a revision to the Sacramento County Improvement Standards Section 9-16C (see Appendix 4):

Overland flow passing over street vertical curves shall not exceed a depth of six inches (6") over the back of walk.

Peak Flow Mitigation

All piped drainage ultimately discharges to a constructed or natural open channel. Trunk drainage channels are constructed whenever an area cannot be piped either for environmental reasons or when the size of the necessary pipe exceeds 72" diameter. There are also occasions when existing open channel conveyances are widened or otherwise improved.

Channel excavation volumes for several specific plan areas were compared to the new Schedule D credit unit prices to determine this component of the fee plan.

Channel widths are increased in Zone 11A due to the Sacramento County Improvement Standards Section 9-11 in which the Manning's "n-value" was increased from the previously specified 0.060 to 0.080. This accounts for increased desire to create natural channels with reduced maintenance and better riparian habitat, pursuant to the goals of the Clean Water Act and the Endangered Species Act as well as the desires of the local citizens. This is further described in appendix of this document.

Peak flow mitigation may include the following:

- Concrete lining
- Interpretive signs
- Channel excavation
- Maintenance access
- Fencing
- Hydroseeding
- Existing pump station improvements
- Floodwall to mitigate existing flooding concerns

Volume Mitigation

Peak flow detention basins are constructed to attenuate high water to accommodate a downstream constraint or impact to a floodplain or stream confluence. For the improvement of storm water quality, detention volume is often added to the bottom of the flood basin volume creating a wet volume area for settling of particulates from the water.

Volume impacts are accommodated in the form of floodplain management, pump station operation, or detention. Volume impacts were measured for a typical small 160 acre drainage shed, the point at which a large diameter pipe might discharge to a creek, stream or channel.

The total cost of basins included in several drainage master plans for specific plan areas was used to calculate the cost per acre of development. While it is realized that not every development will require a detention basin, the regional nexus is found as discussed earlier in this text and in Titles 1 and 2.

Assuming simple detention basin projects are the typical solution, the volume of storage that would be required was calculated using HEC1 software and the Sacramento Method.

Assumptions used for peak flow and volume:

- SacPre Zone 2, Elevation 100', Slope 0.50%, Soil Type C*, Shed160-acres.
- Conveyance of the 10-year peak flow is conveyed without concern.
- Consider the volume above 10-year peak flow conveyance for build-out of the 160 acres to a total impervious percentage of 15% to 90%.

**NOTE: Soil type D was also run, yielding very similar results.*

The above listed impervious percentages and the volume impact above the ten year flow represent a fictitious build out of a 160 acre shed area with one type of development, edge to edge. This is done to determine a relative difference and is not intended to be indicative of any specific site or storm water shed. This is explained further in the appendix of this document.

Basin Real Estate

There will be many detention basins of various functions in this Zone. Basin real estate credits are necessarily limited only for those basins that are in accordance with the description under Measurement and Payment section above.

Railroad Bridges

Occasionally railroad bridges cross over creeks and channels in developing areas must be widened or deepened to allow for the design hydraulics.

Utility Relocation

Proper planning and engineering discovery will avoid utility conflicts. When conflicts do arise, the utility is generally required to relocate at no cost to the Agency. There is a nominal budget for utility relocation that is only available when all other avenues are exhausted.

Engineering

There is an 8 percent allowance for engineering that is applied to all construction components (pipes, channels, and detention basins) of the drainage credit agreements. This is not intended to be full compensation; indeed, it is only intended to compensate the developer for a reasonable portion of the engineering costs associated with the fact that trunk drainage facilities typically serve other upstream, downstream and adjacent properties.

Administration

Zone 11A administration costs are listed below.

1. Administration (external expenditures) includes: legal notices, public outreach, blue printing, copying, postal service, supplies, permits, consultant

- contracts, fiscal services staff, legal counsel, and specialized computer software.
2. Administration (Department of Water Resources Labor) includes staff time reviewing: hydrology and hydraulic analyses, planning applications, improvement plans and environmental documents involving trunk drainage. It also includes administration of the credit and reimbursement agreements pursuant to this Fee Plan.
 3. Administration (SWPPP and minor drainage) includes Department of Water Resources staff time reviewing: storm water pollution prevention plans, erosion control plans, grading and drainage for shed areas smaller than 30-acres.
 4. Administration (NPDES program labor) includes the Department of Water Resources staff time implementing the National Pollution Discharge Elimination System, an ever improving effort to improve the quality of surface water as it is conveyed to streams and rivers.
 5. Administration (Other County labor) includes: a nominal budget for handling plan intake and accumulating comments (Land Development and Site Improvement Review), Building Inspection Division's accounting and cashier services for collection of fees pursuant to the Plan, accounting services for the administration of the Plan, obtaining as-built field quantities, and computer technical support.

The fee component for Department of Water Resources Labor includes master plan review, routine improvement plan review, and administration of the Zone 11A fee plan.

Total administration costs are tabulated for fiscal years 2003-2004 through 2006-2007 in Table 3.

TABLE 3 Average Overhead Costs (Zone 11A)
(FY03-04 through FY 06-07)

Zone 11A	Average Annual (FY04 to FY07)
Overhead	\$ 19,334
Consultants	\$ 151,228
Construction	\$ 161,267
Legal Services	\$ 28,151
Labor Accounting & Fiscal Services	\$ 22,645
Construction Management	\$ 9,333
Other Department	\$ 0
Department of Water Resources (DWR)	\$ 747,190
Real Estate	\$ 16,220
Site Improvement Permit Section & Technical Resources	\$ 63,969
Miscellaneous	\$ 4,345
Total 20-Object	\$1,223,682.00
Total 11A Fees	
Cash	\$ 6,430,219
Credits Applied	\$ 3,375,118
Fees Zone 11A	\$9,805,337
Total 20-Objects /Fees	
DWR Labor	7.62%
Other Labor & Fees	1.19%
DWR Consultants	1.54%

The 2004 Fee Plan looked at four specific plan areas East Franklin, Sunridge, Vineyard Springs, and North Vineyard Station using the finance plans and drainage master plans for those areas the trunk drainage was summed and compared to the developable area this is deemed a reasonable representation of trunk drainage.

The table below calculates the new average (RD5) fee rate, amounting to a 4.26% fee increase from the effective 2014 fee.

TABLE 4 New Average (RD5) Fee Rate (Zone 11A)
(Based on a typical area of 7,135 acres)

Zone 11A	Percent Increase	Fee Component Per Acre
Trunk Pipe		\$ 3,346
Peak Flow (Channels)		\$ 1,828
Volume (Flood And Stormwater Basin)		\$ 2,300
Basin Rel Estate (Flood Control)		\$3,484
Crossing (Railroad)		\$ 187
Utility Relocation		\$ 221
Subtotal		\$11,366
Contingency and Absorption	15.00%	\$ 2,053
Contribution to South SAC HCP *	0.00%	\$ 105
Credit Developer's Consultant ^[1]	8.00%	\$ 631
DWR Consultants ^[2]	1.54%	\$ 178
Administration – External	2.84%	\$ 332
DWR Labor ^[2]	7.62%	\$ 938
Other County Labor ^[2]	1.19%	\$ 137
Subtotal		\$4,374.00
Total		\$15,740
<hr/>		
<i>Current 2014 Fee (Avg)</i>		<i>\$ 15,097</i>
<i>Proposed Fee Increase Percentage (Avg)</i>		<i>4.26%</i>
SOUTH SACRAMENTO HCP (ESTIMATED) *		
Legal FY11		\$ 600.00
Planning FY11		<u>\$ 150.00</u>
<i>FY11 Total</i>		<i>\$ 750.00</i>
Spread over 7,135 acres of development		\$ 105 per acre

[1.] No consultant credit applied to basin real estate cost

[2.] Matching average cost for FY 04 to FY 07

[3.] Added hydromod basin cost

Contingency and Absorption

The contingency amount includes, but is not limited to:

1. Appurtenant structures and features to accompany the major trunk drainage facilities, as listed in Schedule D;
2. A nominal allowance development absorption and vacant remainder parcels within the Zones; and
3. Interest costs on reimbursement agreements.

Sub-Fees within Zone 11A

Beach Stone Lake Flood Volume Mitigation Fee

Point Pleasant, Glanville Tract, and Interstate 5 rely upon a railroad (WPRR) grade to function as their upstream levee, and that embankment (which was not constructed to levee standards) failed in both 1986 and 1997. The County is working with State Department of Water Resources (DWR) staff to formulate a project that upgrades existing RD 1002 levees, that improves the function of the WPRR grade pursuant to levee standards, and to evaluate alternatives for protecting the area from south-to-north flows. Finally, there is an effort to examine means of reducing flood hazard upstream of the WPRR.

All of Zone 11A contributes to the Interstate 5 / Point Pleasant Flood Protection Project in the amount of \$220.00 per acre (in 2003 dollars) as provided in Schedule 11A and adjusted annually in accordance with Section 2.50 of Title 2. These funds are to be held in reserve for contribution toward a flood damage reduction project that will be formulated by California Department of Water Resources as it advances the CALFED North Delta program in coordination with flood control elements at Lambert Road and Point Pleasant.

This subject has been heard several times by the Board, as of the writing of this document. The project is evolving. The reader interested in the history of the fee is referred to:

- On October 2, 2001, Sacramento County Water Agency Board, Item #32 on October 2, 2001, Coordination of CALFED North Delta Project and Sacramento County's Interstate 5, Point Pleasant Flood Protection Project;
- Board of Supervisors, Item #60 on November 24, 1998, Beach Stone Lake Flood Control Plan;
- Board of Directors Sacramento County Water Agency, On February 11, 1992 Update on the Lambert Road Flood Control Project...;
- Sacramento County Board of Supervisors, April 17, 1990, Lower Morrison Creek Drainage Improvements...; and
- Sacramento County Board of Supervisors, October 26, 1988, Report Back... Morrison & Laguna Creek Drainage Basin.

The Beach Stone Lake mitigation fee component is described in Appendix 1 fee Schedule "A" and is not revised herein other than to inflate it by the same amount as Zone 11A.

Zone 11A Fee Reductions

In the 1996 Fee Plan, certain areas were described as reduced Zone 11A fee areas; this continued in the 2004 Fee Plan and continues herein. These reduced fees are inflated by the same amount as Zone 11A.

Within the proposed Zone 11A fee area, there are specific developments which were assessed a reduced Morrison Creek Stream Group Fair Share (MCSG) fee rate. These developments are: Laguna West, Lakeside, Elliott Ranch South, Laguna Business Park (Laguna Oaks, Parkside Village), and Calvine-99 SPA (Property "A").

These developments constructed extensive trunk drainage and detention facilities. Rather than giving them drainage credits against the full fee, they were given a reduction in the old MCSG fee rate based on the value of the facilities constructed. With creation of Zone 11A and its revised fee, in 1996, these areas will be assessed at an appropriately revised fee rate. An explanation of the fee reduction is below.

Laguna West, Lakeside, Elliott Ranch South

These developments provided drainage facilities which were allowed to receive full reduction of most component costs of the fee. The exceptions were for trunk pipe and channel construction, which are assessed at the full rate.

Laguna Business Park (Laguna Oaks, Parkside Village), Calvine-99 SPA (Property "A")

These developments provided drainage facilities which were comparable to drainage master plan floodplain corridors. These facilities are located along Elk Grove Creek (Laguna Business Park) and Strawberry Creek (Calvine 99SPA). These facilities were significant in size and allowed for complete reduction of many of the component costs of the fee. The exceptions were for dual-purpose detention construction and property acquisition. For these components the developments received a 56% reduction of the component fee rates. Also, no reduction in component fee rate was given for trunk pipe construction, channel construction or volume detention.

The Zone 11A fees for these aforementioned areas are detailed in the fee schedule. They were each increased by an amount associated with the increase in Schedule D and the increased cost of Department of Water Resources staff for plan check and storm water pollution prevention. These fees will be revised annually pursuant to Section 2.50.080.

ZONE 11B

Zone 11B is that area draining toward the American River. There are opportunities for infill and redevelopment including trunk drainage construction. Department of Water Resources labor costs account for a disproportionate percentage of the revenue due to the size and complexity of infill development activities prevalent in this Zone.

Cash flow for Zone 11B is described in Appendix 5 and 6.

Fee Plan For Zone 11B - Components

Trunk drainage facilities within the following shed areas (Table 5) were studied in the 1996

Fee Plan, and remain unchanged in this update. The revision considers the effect of the revised Schedule D, plus administration, engineering and contingencies.

TABLE 5 Shed Areas (Zone 11B)

Creek	Sample Watersheds (net area)
Chicken Ranch Slough	2436 acres
Strong Ranch Slough	861 acres
Verde Cruz Creek	888 acres
Coyle Creek	758 acres
Total Shed *	4943 acres

* The 1996 Fee Plan reduced this gross acreage by 20% for roads and other unbuildable areas: 4943 acres x 80% = **3954 acres**.

Closed Conduit (Pipes)

In the 1996 Fee Plan, a sample trunk facility inventory was summarized in the Chicken Ranch Slough, Strong Ranch Slough, Verde Cruz Creek, and Coyle Creek watersheds, in an effort to determine the typical trunk pipe facilities in Zone 11B. These same figures were used for the 2004 Fee Plan and continue forward in this update.

These quantities are carried forward in this 2015 update (see Table 6).

Peak Flow Mitigation

Zone 11B drains to natural streams and legacy channels. Peak flow mitigation may include the following:

- Concrete lining
- Interpretive signs
- Channel excavation
- Maintenance access
- Fencing
- Hydroseeding
- Existing pump station improvements
- Floodwall to mitigate existing flooding concerns

Items that are expressly not creditable, thus not included in the fee plan, are wetland mitigation and channel right of way acquisition.

TABLE 6

Storm Drain Pipe and Manhole Fee Schedule (Zone 11B)
(2004 Sacramento County Fee Plan)

Item	Quantity
21" storm drain pipe	18,125 LF
24" storm drain pipe	38,492 LF
27" storm drain pipe	7,400 LF
30" storm drain pipe	20,320 LF
33" storm drain pipe	1,145 LF
36" storm drain pipe	19,620 LF
42" storm drain pipe	18,978 LF
48" storm drain pipe	4,342 LF
54" storm drain pipe	5,245 LF
60" storm drain pipe	1,990 LF
66" storm drain pipe	1,300 LF
72" storm drain pipe	1,007 LF
84" storm drain pipe	675 LF
Manholes	233 LF

Volume Mitigation

Volume mitigation includes flood control and stormwater quality basins construction for watershed areas greater than 30-acres, including some or all of the following:

- Basin land acquisition when the facility is regionally beneficial flood control for the watershed, approved by the Agency Engineer in accordance with Section 2.40 and in accordance with the requirements found in the Measurement and Payment of Credits section of this Plan
- Basin excavation
- Outlet features
- Maintenance access
- Fencing
- Hydroseeding

Railroad Bridges

There are no railroad bridges included in this fee.

Utility Relocation

Proper planning and engineering discovery will avoid utility conflicts. When conflicts do arise, the utility is generally required to relocate at no cost to the Agency. There is a nominal budget for utility relocation that is only available when all other avenues are exhausted.

Engineering

There is an 8 percent allowance for engineering that is applied to all construction components (pipes, channels, and detention basins) of the drainage credit agreements. This is not intended to be full compensation; indeed, it is only intended to compensate the developer for a reasonable portion of the engineering costs associated with the fact that trunk drainage facilities typically serve other upstream, downstream and adjacent properties.

Administration

Zone 11B administration costs are listed below.

1. Administration (external expenditures) includes: legal notices, public outreach, blue printing, copying, postal service, supplies, permits, consultant contracts, fiscal services staff, legal counsel, and specialized computer software.
2. Administration (Department of Water Resources Labor) includes staff time reviewing: hydrology and hydraulic analyses, planning applications, improvement plans and environmental documents involving trunk drainage. It also includes administration of the credit and reimbursement agreements pursuant to this Fee Plan.
3. Administration (SWPPP and minor drainage) includes Department of Water Resources staff time reviewing: storm water pollution prevention plans, erosion control plans, grading and drainage for shed areas smaller than 30-acres.
4. Administration (NPDES program labor) includes the Department of Water Resources staff time implementing the National Pollution Discharge Elimination System, an ever improving effort to improve the quality of surface water as it is conveyed to streams and rivers.
5. Administration (Other County labor) includes: a nominal budget for handling plan intake and accumulating comments (Land Development and Site Improvement Review), Building Inspection Division's accounting and cashier services for collection of fees pursuant to the Plan, accounting services for the administration of the Plan, obtaining as-built field quantities, and computer technical support.

The fee component for Department of Water Resources Labor includes master plan review, routine improvement plan review, and administration of the Zone 11B fee plan.

The average of the four years FY03-04 through FY 06-07 is shown below, with calculated average overhead costs (see Table 7).

TABLE 7 Average Overhead Costs (Zone 11B)
(Average of the four years FY03-04 through FY 06-07)

Zone 11B	Average Annual (FY04 to FY07)
Overhead	\$ 12,222
Consultants	\$ 5,460
Construction	\$ 0
Legal Services	\$ 0
Accounting & Fiscal Services	\$ 745
Construction Management	\$ 0
Other Department	\$ 1,031
Department of Water Resources (DWR)	\$ 385,857
Real Estate	\$ 0
Site Improvement Permit Section & Technical Resources	\$ 43,278
Miscellaneous	\$ 1,903
Total 20-Object	\$450,496
Total 11B Fees	
Cash	\$ 1,248,590
Credits Applied	\$ 125,769
Fees Zone 11B	\$1,374,359
Total 20-Objects & Fees	
DWR Labor	28.08%
Other Labor & Fees	3.42%
DWR Consultants	0.40%

The 2004 Fee Plan carried forward the quantities established in the 1996 Fee Plan. These are typical trunk drainage systems in the 11B area and representative of the work necessary for infill development.

The table below calculates the new average (RD5) fee rate, amounting to a 1.48% fee increase from the effective 2014 fee.

TABLE 8 New Average (RD5) Fee Rate (Zone 11B)*(Based on a typical area of 3,954 acres)*

Zone 11B	Percent Increase	Fee Component Per Acre
Trunk Pipe		\$ 3,342
Peak Flow (Channels)		\$ 1,396
Volume (Flood And Stormwater Basin)		\$ 373
Basin Rel Estate (Flood Control)		\$ 782
Crossing (Railroad)		\$ 0
Utility Relocation		\$ 66
<i>Subtotal</i>		<i>\$5,959</i>
Contingency and Absorption	15.00%	\$1,388
Credit Developer's Consultant ^[1]	8.00%	\$ 414
DWR Consultants ^[4]	3.00%	\$ 184
Administration – External	2.63%	\$ 161
DWR Labor ^[2]	28.08%	\$2,327
Other County Labor ^[2]	3.42%	\$ 211
<i>Subtotal</i>		<i>\$4,685</i>
Total		\$10,644
<i>Current 2014 Fee (Avg)</i>		<i>\$ 10,489</i>
<i>Proposed Fee Increase Percentage (Avg)</i>		<i>1.48%</i>

Credits will increase more than fees in Zone 11B

[1.] No consultant credit applied to basin real estate cost

[2.] Matching average cost for FY 04 to FY 07

[3.] Significant adjustments to basin, channel, and pump stations

[4.] Added budget for consultants for Clean Water Act compliance

Contingency and Absorption

The contingency amount includes, but is not limited to:

1. Appurtenant structures and features to accompany the major trunk drainage facilities, as listed in Schedule D;
2. A nominal allowance development absorption and vacant remainder parcels within the Zones; and
3. Interest costs on reimbursement agreements.

ZONE 11C

Zone 11C is that area draining to Dry Creek or to the Natomas East Main Drainage Canal (Steelhead Creek). It includes Elverta, Rio Linda, Antelope and parts of Orangevale. There remain significant opportunities for growth in these areas. The largest development area is the Elverta Specific Plan.

Cash flow for Zone 11C is described in Appendix 5 and 6.

Fee Plan for Zone 11C

Closed Conduit (Pipes)

The trunk drainage facilities estimated for the Elverta Specific Plan area are listed in the 2014 Draft Trunk Drainage Finance Estimate. These quantities were combined with the new Schedule D credit unit prices to determine this component of the fee plan.

Peak Flow Mitigation

All piped drainage ultimately discharges to a constructed or natural open channel. Trunk drainage channels are constructed whenever an area cannot be piped either for environmental reasons or when the size of the necessary pipe exceeds 72" diameter. There are also occasions when existing open channel conveyances are widened or otherwise improved.

1. Channel excavation volumes for several specific plan areas were compared to the new Schedule D credit unit prices to determine this component of the fee plan
2. Storm Water Quality is improved by careful design of channel bottom grading and planting.

Peak flow mitigation may include the following:

- Concrete lining
- Interpretive signs
- Channel excavation
- Maintenance access
- Fencing
- Hydroseeding
- Existing pump station improvements
- Floodwall to mitigate existing flooding concerns

Volume Mitigation

Peak flow detention basins are constructed to attenuate high water to accommodate a downstream constraint or impact to a floodplain or stream confluence. For the improvement of storm water quality, detention volume is often added to the bottom of the flood basin volume creating a wet volume area for settling of particulates from the water.

Volume impacts are accommodated in the form of floodplain management, pump station operation, or detention. Volume impacts were measured for a typical small 160 acre drainage shed, the point at which a large diameter pipe might discharge to a creek, stream or channel.

The total cost of basins included in several drainage master plans for specific plan areas was used to calculate the cost per acre of development. While it is realized that not every development will require a detention basin, the regional nexus is found as discussed earlier in this text and in Titles 1 and 2.

Assuming simple detention basin projects are the typical solution, the volume of storage that would be required was calculated using HEC1 software and the Sacramento Method.

Assumptions used for peak flow and volume:

- SacPre Zone 2, Elevation 100', Slope 0.50%, Soil Type C*, Shed 160-acres.
- Conveyance of the 10-year peak flow is conveyed without concern.
- Consider the volume above 10-year peak flow conveyance for build-out of the 160 acres to a total impervious percentage of 15% to 90%.

**NOTE: Soil type D was also run, yielding very similar results.*

The above listed impervious percentages and the volume impact above the ten year flow represent a fictitious build out of a 160 acre shed area with one type of development, edge to edge. This is done to determine a relative difference and is not intended to be indicative of any specific site or storm water shed.

This is further described in Appendix 3.

Basin Real Estate

There will be many detention basins of various functions in this Zone. Basin real estate credits are necessarily limited only for those basins that are in accordance with the description under Measurement and Payment of Credits section above.

Utility Relocation

Proper planning and engineering discovery will avoid utility conflicts. When conflicts do arise, the utility is generally required to relocate at no cost to the Agency. There is a nominal budget for utility relocation that is only available when all other avenues are exhausted.

Engineering

There is an 8 percent allowance for engineering that is applied to all construction components (pipes, channels, and detention basins) of the drainage credit agreements. This is not intended to be full compensation; indeed, it is only intended to compensate the developer for

a reasonable portion of the engineering costs associated with the fact that trunk drainage facilities typically serve other upstream, downstream and adjacent properties.

Administration

Zone 11C administration costs are listed below.

1. Administration (external expenditures) includes: legal notices, public outreach, blue printing, copying, postal service, supplies, permits, consultant contracts, fiscal services staff, legal counsel, and specialized computer software.
2. Administration (Department of Water Resources Labor) includes staff time reviewing: hydrology and hydraulic analyses, planning applications, improvement plans and environmental documents involving trunk drainage. It also includes administration of the credit and reimbursement agreements pursuant to this Fee Plan.
3. Administration (SWPPP and minor drainage) includes Department of Water Resources staff time reviewing: storm water pollution prevention plans, erosion control plans, grading and drainage for shed areas smaller than 30-acres.
4. Administration (NPDES program labor) includes the Department of Water Resources staff time implementing the National Pollution Discharge Elimination System, an ever improving effort to improve the quality of surface water as it is conveyed to streams and rivers.
5. Administration (Other County labor) includes: a nominal budget for handling plan in-take and accumulating comments (Land Development and Site Improvement Review), Building Inspection Division's accounting and cashier services for collection of fees pursuant to the Plan, accounting services for the administration of the Plan, obtaining as-built field quantities, and computer technical support.

The fee component for Department of Water Resources Labor includes master plan review, routine improvement plan review, and administration of the Zone 11C fee plan.

The average of the four years FY03-04 through FY 06-07 is shown below, with calculated average overhead costs (see Table 9).

TABLE 9 Average Overhead Costs (Zone 11C)*(Average of the four years FY 04 through FY 07)*

Zone 11C	Average Annual (FY04 to FY07)
Overhead	\$ 10,364
Consultants	\$ 11,312
Construction	\$ 0
Legal Services	\$ 0
Accounting & Fiscal Services	\$ 361
Construction Management	\$ 0
Other Department	\$ 0
Department of Water Resources (DWR)	\$ 252,719
Real Estate	\$ 852
Site Improvement Permit Section & Technical Resources	\$ 36,721
Miscellaneous	\$ 2,173
Total 20-Object	\$314,502
Total 11C Fees	
Cash	\$ 861,727
Credits Applied	\$ 98,520
Fees Zone 11B	\$960,247
Total 20-Objects & Fees	
DWR Labor	26.32%
Other Labor & Fees	4.18%
DWR Consultants	1.18%

The table below calculates the new average (RD5) fee rate, amounting to a 7.00% fee increase from the effective 2014 fee.

TABLE 10 New Average (RD5) Fee Rate (Zone 11C)
(Based on a typical area of 873 acres)

Zone 11B	Percent Increase	Fee Component Per Acre
Trunk Pipe		\$ 2,783
Peak Flow (Channels)		\$ 3,933
Volume (Flood And Stormwater Basin)		\$ 3,062
Basin Rel Estate (Flood Control)		\$ 0
Crossing (Railroad)		\$ 0
Utility Relocation		\$ 144
Subtotal		\$9,922
Contingency and Absorption	15.00%	\$2,065
Credit Developer's Consultant ^[1]	8.00%	\$ 794
DWR Consultants ^[2]	1.57%	\$ 158
Administration – External	2.63%	\$ 268
DWR Labor ^[3]	17.87%	\$2,159
Other County Labor ^[2]	4.46%	\$ 463
Subtotal		\$5,907
Total		\$15,829
<i>Current 2014 Fee (Avg)</i>		\$ 14,793
<i>Proposed Fee Increase Percentage (Avg)</i>		7.00%

[1.] No consultant credit applied to basin real estate cost

[2.] Matching average cost for FY 04 to FY 07

[3.] Reduce Labor to force increase to 7.0%

Contingency and Absorption

The contingency amount includes, but is not limited to:

1. Appurtenant structures and features to accompany the major trunk drainage facilities, as listed in Schedule D;
2. A nominal allowance development absorption and vacant remainder parcels within the Zones; and
3. Interest costs on reimbursement agreements.

Sub-Fees Within Zone 11C

There are subzone fees in addition to Zone 11C, with fee amounts listed on the Fee Schedule, as described below.

Placer County Dry Creek Fair Share Fees

This supplemental fee is for the mitigation of impacts within Placer County and shall only be collected from new construction/development of properties that drain to Placer County. Linda Creek flows into Roseville and ultimately into Dry Creek consequently having a different impact and different fee than that amount charged to new construction in the portion of the Antelope area that drains toward Placer County. These fees are deposited to sub-accounts of Zone 11C and sent annually to Placer County where they are held in trust for specific improvements described in the Dry Creek Drainage Master Plan.

History:

On October 6, 1987 a Memorandum of Understanding Concerning Flood Control, Drainage, and Water Conservation Activities in Placer, Sacramento and Sutter Counties and the City of Sacramento was signed (WA Resolution #779).

In April 1992, the Placer County Flood Control and Water Conservation District and Sacramento County Water Agency Final Report Dry Creek Flood Control Plan was published. The Plan recommends six structural and non-structural program elements as follows:

- Local detention basins;
- Regional detention basins;
- Channel improvements, levees, and floodwalls;
- Bridge and culvert improvements;
- Floodplain management; or
- Regional data acquisition and flood warning system.

January 23, 1996 Resolution 96-0056 and WA Resolution #2202 approved the Dry Creek Watershed Flood Control Program Final Environmental Impact Report (Control Number 95-0577). These resolutions found that the Final Environmental Impact Report for the Dry Creek Watershed Flood Control Program was adequate and agreed to establish a fair share fee for contribution to the project.

March 19, 1996 letter to the Board of Supervisors titled Linda Creek Fair Share Contribution Condition (filed March 26, 1996, numbered as 19).

Dry Creek Watershed (Flowing North Across The County Line And Into Dry Creek)

Prior to improvement plan approval or recordation of the final map, whichever occurs first, a drainage fee as identified in the Placer County Dry Creek Watershed Flood Control Plan shall be paid. In 1996, the amount of the fee was \$950.00 per acre for commercial and industrial land uses, and \$125.00 per residential unit.

The fee shall be inflated now, and in the future inflated annually, by the ENR Construction Cost Index. The 1996 fee is increased 17.8% to 2003 dollars to \$1119 per acre for commercial and industrial uses, and \$147 per residential unit.

These funds are remitted annually to Placer County where they are to be held in interest bearing trust and used for activities specified in the April 1992 Plan or as amended. This fee shall continue to be deemed interim and shall be subject to periodic review.

Linda Creek Watershed

A fair share contribution is payable prior to improvement plan approval or recordation of the final map, whichever occurs first. In 1996, the fair share contribution was \$621 per acre for commercial and industrial land uses, and \$490 per residential unit.

The fee shall be inflated now, and in the future inflated annually, by the ENR Construction Cost Index. The 1996 fee is increased 17.8% to 2003 dollars to \$731 per acre for commercial and industrial uses, and \$577 per residential unit (not to exceed \$731 per acre).

These funds are remitted annually to Placer County where they are to be held in interest bearing trust and used for activities specified in the April 1992 Plan or as otherwise amended. This fee shall continue to be deemed interim and shall be subject to periodic review.

Steelhead Creek Fair Share Fee

The area east of Steelhead Creek (also known as the Natomas East Main Drain Tributaries, NEMDC) flooded in 1986 and again in 1995. High water was measured at an elevation of nearly 37 feet at Elkhorn Blvd and Elverta Road. Subsequent construction of the D15 pump station (including three pumps totaling 1000 cubic feet per second and an automatic gravity outlet) lowered the 100-year FEMA floodplain adjacent to the channel levee to elevation 31 feet at Elkhorn Blvd and 32.5 feet one mile north of Elverta Road. The Sacramento County Department of Water Resources regulates new construction using a conservative floodplain of elevation that is 2.2' higher than the FEMA map. This allows for the possibility of one pump being out of service during a 100-year storm.

D15 pump station serves to lower the water surface elevation inside of the NEMDC levees by blocking Dry Creek backwater from backing up the canal while pumping the water into the downstream higher water surface. This system allows for gravity outfall from the 17,216 acres draining to the east side of NEMDC.

According to engineering analysis, when development of the basin east of NEMDC is completed, the all three pumps running scenario will yield a higher 100-year water surface elevation upstream of D-15 pump station, calculated to rise 1.2 feet, at the Elkhorn Blvd bridge. Therefore, in order to maintain the current regulated floodplain with the possibility of one pump failing during the 100-year event, one must add a fourth pump.

While the repair and replacement cost of the existing facility will be paid by other funds, the cost of mitigation due to volume impacts attributed to development should be an anticipated future cost of this Zone 11C Fee Plan.

Estimated cost to add a fourth pump to the D-15 Pump Station is \$3,000,000 (based on other pump plants recently constructed and original cost of existing D-15). If it is constructed after 65% build out of the area, the fee per acre shall be:

$$(\$3,000,000 \div 17216 \text{ acres}) \div 65\% = \$268 \text{ per acre}$$

Annual Fee Adjustment

Steelhead Creek Volume Mitigation Fee is adjusted annually.

Referring to volume impacts, see Table H in Appendix 3 of this text, and assuming an average one acre residential zoning (percent impervious area of 20%) the fee shall be apportioned according to the adjusted component impact. This amount will be inflated annually, per Section 2.50.080. This fee is detailed on the Zone 11C Fee Schedule.

The basin impact percentages are the same as those used in Zone 11A and 11C volume component calculations earlier in this text. The pump station D-15 component is centered around a typical 20% impervious area for the basin at build out. That is 63.42% is to 100% as 108.24% is to 171%. Therefore, the fee for a proposed development that has 50% impervious area is \$457 per acre (2004 Fee Plan).

The fee described above is inflated by the construction cost index through 2008, plus the CCI for 2013, and the adjustment for 11C fee for this fee study update.

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APPENDIX 1 SCHEDULE A**Table A1 - Zone 11A Fees**

DRAINAGE FEE SCHEDULE "A"			
ZONE 11A FEES			
(4.26% proposed increase)			
LAND USE	Proposed 2015 Zone 11A Fee	Proposed 2015 Fee for Parcels Recorded before 8/16/2004	Proposed 2015 Beach Stone Lake
Raw Land and Open Space	\$ 0	\$ 0	\$ 0
Road Right-of-Way, greater than 40' ^[1]	\$ 0	\$ 0	\$ 0
Residence on 5.0 acres(+) ^[5]	\$ 0	\$ 0	\$ 0
Residence on 3.5 acres ^[5]	\$ 4,902	\$ 869	\$ 16
Residence on 2.0 acres ^[5]	\$ 9,776	\$ 1,521	\$ 28
Residence on 1.0 acre ^[5]	\$ 13,016	\$ 3,042	\$ 56
Residence on 0.50 acre ^[5]	\$ 13,404	\$ 5,949	\$ 112
Residence on 0.25 acre ^[5]	\$ 15,210	\$ 11,359	\$ 225
Residence on 0.20 acre ^[5]	\$ 15,740	\$ 13,861	\$ 281
Residence on 0.14 acre ^[5]	\$ 16,496	\$ 16,496	\$ 281
Residence on 0.10 acre ^[5]	\$ 17,923	\$ 17,923	\$ 281
Residential RD20 to RD30	\$ 19,112	\$ 19,112	\$ 281
Mobile Home Park	\$ 19,739	\$ 19,739	\$ 281
Industrial	\$ 20,750	\$ 20,750	\$ 281
Commercial (office/retail)	\$ 21,134	\$ 21,134	\$ 281
Parking Lot	\$ 21,134	\$ 21,134	\$ 281
Public School Campus ^[6]	\$ 16,496	\$ 16,496	\$ 281
School Campus with detention ^[2]	\$ 8,248	\$ 8,248	\$ 281
Sports Field graded with field drains	\$ 12,792	\$ 12,792	\$ 281
Sports Field no piped field drains	\$ 4,902	\$ 4,902	\$ 281
Sports Field with detention ^[2]	\$ 2,451	\$ 2,451	\$ 281
Impervious areas of park ^[2]	\$ 21,134	\$ 21,134	\$ 281

[1] The fees are calculated based on the net parcel area plus 20 feet of road width. That is, a 1.00 acre parcel fronting 300 feet of a thoroughfare shall pay fees based on $43560\text{sf} + (300' \times 20') = 1.138$ acre

[2] Pursuant to Section 2.50.050, a school or park that detains greater than 50% of the peak flow volume, at the discretion of Water Resources, may reduce the fee by 50%.

[3] Beach Stone Lake Volume Mitigation Fee is accounted for separate from Zone 11A.

[4] Pursuant to Section 2.50.060 the fee is reduced for parcels recorded prior to adoption of this Fee Plan. RD5 and larger lots are adjusted to 2003 fee plus 20%.

[5] Equation- use straight line interpolation.

[6] Public Schools pay one time as they don't necessarily return to county for additional building permits.

Table B1 - Zone 11B

DRAINAGE FEE SCHEDULE "A"		
ZONE 11B FEES		
(1.48% proposed increase)		
LAND USE	Proposed 2015 Zone 11B Fee	Proposed 2015 Fee for Parcels Recorded before 8/16/2004
Raw Land and Open Space	\$ 0	\$ 0
Road Right-of-Way, greater than 40' ^[1]	\$ 0	\$ 0
Residence on 5.0 acres(+) ^[4]	\$ 0	\$ 0
Residence on 3.5 acres ^[4]	\$ 3,483	\$ 686
Residence on 2.0 acres ^[4]	\$ 6,967	\$ 1,200
Residence on 1.0 acre ^[4]	\$ 9,290	\$ 2,400
Residence on 0.50 acre ^[4]	\$ 9,494	\$ 4,800
Residence on 0.25 acre ^[4]	\$ 10,375	\$ 9,601
Residence on 0.20 acre ^[4]	\$ 10,644	\$ 10,644
Residence on 0.14 acre ^[4]	\$ 10,992	\$ 10,992
Residence on 0.10 acre ^[4]	\$ 11,931	\$ 11,931
Residential RD20 to RD30	\$ 12,731	\$ 12,731
Mobile Home Park	\$ 13,771	\$ 13,771
Industrial	\$ 13,771	\$ 13,771
Commercial (office/retail)	\$ 13,950	\$ 13,950
Parking Lot	\$ 13,950	\$ 13,950
Public School Campus ^[5]	\$ 10,992	\$ 10,992
School Campus with detention ^[2]	\$ 5,496	\$ 5,496
Sports Field graded with field drains	\$ 9,290	\$ 9,290
Sports Field no piped field drains	\$ 3,483	\$ 3,483
Sports Field with detention ^[2]	\$ 1,742	\$ 1,742
Impervious areas of park ^[2]	\$ 13,950	\$ 13,950

[1] The fees are calculated based on the net parcel area plus 20 feet of road width. That is, a 1.00 acre parcel fronting 300 feet of a thoroughfare shall pay fees based on $43560\text{sf} + (300' \times 20') = 1.138$ acre

[2] Pursuant to Section 2.50.050, a school or park that detains greater than 50% of the peak flow volume, at the discretion of Water Resources, may reduce the fee by 50%. Beach Stone Lake Volume Mitigation Fee is accounted for separate from Zone 11A.

[3] Pursuant to Section 2.50.060 the fee is reduced for parcels recorded prior to adoption of this Fee Plan. RD5 and larger lots are adjusted to 2003 fee plus 20%. Equation- use straight line interpolation.

[4] Equation- use straight line interpolation.

[5] Public Schools pay one time as they don't necessarily return to county for additional building permits.

Table C1 - Zone 11A Fees

DRAINAGE FEE SCHEDULE "A"					
ZONE 11C FEES					
(7.00% proposed increase)					
LAND USE	Proposed 2015 Zone 11C Fee	Proposed 2015 Parcels Recorded before 8/16/2004	Sheds Flowing to Dry Creek into Placer County (add'l fee/acre)	Sheds Flowing to Linda Creek (add'l fee/acre)	Sheds Flowing to NEMDC Tributaries (add'l fee/acre)
Raw Land and Open Space	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Road Right-of-Way, greater than 40' [1]	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Residence on 5.0 acres(+) [5]	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Residence on 3.5 acres [5]	\$ 4,948	\$ 723	\$ 55.02	\$ 216	\$ 308
Residence on 2.0 acres [5]	\$ 9,896	\$ 1,265	\$ 96.28	\$ 378	\$ 329
Residence on 1.0 acre [5]	\$ 13,196	\$ 2,531	\$ 192.56	\$ 756	\$ 351
Residence on 0.50 acre [5]	\$ 13,590	\$ 5,061	\$ 385.11	\$ 958	\$ 430
Residence on 0.25 acre [5]	\$ 15,301	\$ 10,123	\$ 770.22	\$ 958	\$ 510
Residence on 0.20 acre [5]	\$ 15,829	\$ 12,654	\$ 962.78	\$ 958	\$ 549
Residence on 0.14 acre [5]	\$ 16,502	\$ 16,502	\$ 1,347.89	\$ 958	\$ 599
Residence on 0.10 acre [5]	\$ 17,762	\$ 17,762	\$ 1,465.78	\$ 958	\$ 665
Residential RD20 to RD30	\$ 18,811	\$ 18,811	\$ 1,465.78	\$958	\$ 719
Mobile Home Park	\$ 19,363	\$ 19,363	\$ 1,465.78	\$ 958	\$ 747
Industrial	\$ 20,272	\$ 20,272	\$ 1,465.78	\$ 958	\$ 774
Commercial (office/retail)	\$ 20,630	\$ 20,630	\$ 1,465.78	\$ 958	\$ 774
Parking Lot	\$ 20,630	\$ 20,630	\$ 1,465.78	\$ 958	\$ 774
Public School Campus [6]	\$ 16,502	\$ 16,502	\$ 1,465.78	\$ 958	\$ 599
School Campus with detention [2]	\$ 8,251	\$ 8,251	\$ 1,465.78	\$ 958	\$ 599
Sports Field graded with field drains	\$ 13,196	\$ 2,531	\$ 1,465.78	\$ 958	\$ 351
Sports Field no piped field drains	\$ 4,948	\$ 723	\$ 1,465.78	\$ 958	\$ 308
Sports Field with detention [2]	\$ 2,474	\$ 362	\$ 1,465.78	\$ 958	\$ 308
Impervious areas of park [2]	\$ 20,630	\$ 20,630	\$ 1,465.78	\$ 958	\$ 774

[1] The fees are calculated based on the net parcel area plus 20 feet of road width. That is, a 1.00 acre parcel fronting 300 feet of a thoroughfare shall pay fees based on 43560sf + (300' x 20') = 1.138 acre

[2] Pursuant to Section 2.50.050, a school or park that detains greater than 50% of the peak flow volume, at the discretion of Water Resources, may reduce the fee by 50%.

[3] Supplemental fees pursuant to Fee Plan and Chapter 2.75

[4] Pursuant to Section 2.50.060 the fee is reduced for parcels recorded prior to adoption of this Fee Plan. RD5 and larger lots are adjusted to 2003 fee plus 20%.

[5] Equation- use straight line interpolation.

[6] Public Schools pay one time as they don't necessarily return to county for additional building permits

Table D1 - Zone 11A Reduced Fees

DRAINAGE FEE SCHEDULE "A" ZONE 11A REDUCED FEES (4.26% proposed increase)		
LAND USE	Proposed 2015 Zone 11A Fee for Laguna West, Lakeside, Elliott Ranch South	Proposed 2015 Zone 11A Fee for Laguna Business Park (Laguna Oaks, Parkside), Calvine-99 SPA
Raw Land and Open Space	0	0
Road Right-of-Way, greater than 40' ^[1]	0	0
Residence on 5.0 acres(+) ^[2]	0	0
Residence on 3.5 acres ^[2]	\$ 355	\$ 494
Residence on 2.0 acres ^[2]	\$ 621	\$ 865
Residence on 1.0 acre ^[2]	\$ 1,242	\$ 1,731
Residence on 0.50 acre ^[2]	\$ 2,484	\$ 3,461
Residence on 0.25 acre ^[2]	\$ 4,969	\$ 6,923
Residence on 0.20 acre ^[2]	\$ 6,211	\$ 8,654
Residence on 0.14 acre ^[2]	\$ 6,297	\$ 8,825
Residence on 0.10 acre ^[2]	\$ 6,425	\$ 9,083
Residential RD20 to RD30	\$ 6,754	\$ 9,791
Mobile Home Park	\$ 7,083	\$ 10,499
Industrial	\$ 7,412	\$ 11,207
Commercial (office/retail)	\$ 7,741	\$ 11,915
Parking Lot	\$ 7,741	\$ 11,915
Public School Campus [3]	\$ 5,113	\$ 7,340
School Campus with detention	\$ 5,113	\$ 7,340
Sports Field graded with field drains	\$ 2,070	\$ 2,766
Sports Field no piped field drains	\$ 2,070	\$ 2,766
Sports Field with detention	\$ 2,070	\$ 2,766
Impervious areas of park	\$ 7,741	\$ 11,915

[1] The fees are calculated based on the net parcel area plus 20 feet of road width. That is, a 1.00 acre parcel fronting 300 feet of a thoroughfare shall pay fees based on $43560\text{sf} + (300' \times 20') = 1.138$ acre.

[2] Equation- use straight line interpolation.

[3] Public Schools pay one time as they don't necessarily return to county for additional building permits.

APPENDIX 2 SCHEDULE D (UNIT PRICES)**Table A2 – Credit Schedule**
(Pipes and Manholes)

ZONE 11 CREDIT SCHEDULE				1 of 3
Schedule D	Eff: 3/31/14	Proposed Change	Proposed 2015	
Pipe Size ^[1]				
12"	\$ 32.12	7.0%	\$ 34.37	per lf
15"	\$ 35.84	7.0%	\$ 38.36	per lf
18"	\$ 41.29	7.0%	\$ 44.18	per lf
21"	\$ 47.01	7.0%	\$ 50.30	per lf
24"	\$ 51.51	7.0%	\$ 55.12	per lf
27"	\$ 59.74	7.0%	\$ 63.93	per lf
30"	\$ 61.50	7.0%	\$ 65.80	per lf
33"	\$ 72.23	7.0%	\$ 77.28	per lf
36"	\$ 75.22	7.0%	\$ 80.48	per lf
42"	\$ 102.96	7.0%	\$ 110.16	per lf
48"	\$ 118.50	7.0%	\$ 126.80	per lf
54"	\$ 125.85	7.0%	\$ 134.65	per lf
60"	\$ 140.25	7.0%	\$ 150.06	per lf
66"	\$ 178.73	7.0%	\$ 191.24	per lf
72"	\$ 206.89	7.0%	\$ 221.37	per lf
84"	\$ 206.89	7.0%	\$ 221.37	per lf
96"	\$ 206.89	7.0%	\$ 221.37	per lf
Manhole Size: ^[2]				
48"	\$ 3,036.03	7.0%	\$ 3,248.48	per ea
60"	\$ 4,417.92	7.0%	\$ 4,727.07	per ea
72"	\$ 5,451.79	7.0%	\$ 5,833.30	per ea
84"	\$ 6,365.87	7.0%	\$ 6,811.34	per ea
96"	\$ 7,834.92	7.0%	\$ 8,383.18	per ea
108"	\$ 7,834.92	14.0%	\$ 8,930.00	per ea
Saddle Manhole	\$ 3,917.46	7.0%	\$ 4,191.59	per ea

[1] Note smaller sizes often used for basin outlets

[2] Manhole unit price is complete including rim and lid.

[3] Concrete unit prices include rebar, structure excavation and backfill, sub-base material, and grading.

[4] Same unit price regardless of method of transport.

Table B2 – Credit Schedule
(Fencing, Erosion Control, and Access & Maintenance Roads)

ZONE 11 CREDIT SCHEDULE					2 of 3
Schedule D	Eff: 3/31/14	Proposed Change	Proposed 2015		
Fencing and Gates:					
3' high post + cable	\$ 11.32	7.0%	\$ 12.11	per lf	
Pipe gate	\$ 3,060.52	7.0%	\$ 3,274.68	per ea	
6' high wrought iron with gates	\$ 22.04	7.0%	\$ 23.58	per lf	
6' chain link fence with gates	\$ 13.34	7.0%	\$ 14.28	per lf	
4' chain link fence with gates		new	\$ 13.20	per lf	
Signs 16sf or smaller	\$ 264.43	0.0%	\$ 264.43	per ea	
Signs >16sf	\$ 396.64	0.0%	\$ 396.64	per ea	
Miscellaneous metal (handrails, debris and access racks, and flap gates)	\$ 4.99	7.0%	\$ 5.34	per lb	
4" thick Concrete Channel Lining	\$ 7.35	3.7%	\$ 7.62	per sf	
Channel excavation ^[4]	\$ 3.85	7.0%	\$ 4.12	per cy	
Basin excavation ^[4]	\$ 3.85	0.0%	\$ 3.85	per cy	
Fine grading channel/basin bottom and sides	\$ 0.00		\$ 0.00	per sf	
Erosion Control Riprap (Caltrans Spec.):					
Class 1 backing rock	\$ 36.72	7.0%	\$ 39.29	per ton	
Class 2 backing rock	\$ 39.17	7.0%	\$ 41.91	per ton	
1/4 ton	\$ 42.85	7.0%	\$ 45.85	per ton	
Cobbles	\$ 39.17	7.0%	\$ 41.91	per ton	
GeoWeb - rock weir	\$ 39.79	3.0%	\$ 40.99	per ton	
Access and Maintenance Roads:					
1" thick asph conc	\$ 0.48	0.0%	\$ 0.48	per sf	
1" thick aggr base	\$ 0.29	0.0%	\$ 0.29	per sf	
1" thick Decomposed Granite	\$ 0.38	0.0%	\$ 0.38	per sf	
Geotextile fabric	\$ 0.21	0.0%	\$ 0.21	per sf	

[1] Note smaller sizes often used for basin outlets

[2] Manhole unit price is complete including rim and lid.

[3] Concrete unit prices include rebar, structure excavation and backfill, sub-base material, and grading.

[4] Same unit price regardless of method of transport.

Table C2 – Credit Schedule
(Surface Repair and Miscellaneous Concrete)

ZONE 11 CREDIT SCHEDULE					3 of 3
Schedule D	Eff: 3/31/14	Proposed Change	Proposed 2015		
Repair Surfaces:					
Asphalt concrete patch paving	\$ 9.18	0.0%	\$ 9.18		per sf
Hydroseed	\$ 1,836.31	0.0%	\$ 1,836.31		per acre
Miscellaneous Concrete: ^[3]					
Junction Box	\$ 1,022.21	7.0%	\$ 1,093.74		per cy
Headwall	\$ 1,022.21	7.0%	\$ 1,093.74		per cy
Stairway	\$ 1,022.21	7.0%	\$ 1,093.74		per cy
Flat pad	\$ 612.11	7.0%	\$ 654.94		per cy
Ramp	\$ 612.11	7.0%	\$ 654.94		per cy
Driveway	\$ 612.11	7.0%	\$ 654.94		per cy
Weir Structure	\$ 612.11	7.0%	\$ 654.94		per cy

[1] Note smaller sizes often used for basin outlets

[2] Manhole unit price is complete including rim and lid.

[3] Concrete unit prices include rebar, structure excavation and backfill, sub-base material, and grading.

[4] Same unit price regardless of method of transport.

APPENDIX 3 DEVELOPMENT IMPACT ANALYSIS

This appendix continues forward pursuant to the 2004 Fee Plan.

Parts:

- Commercial versus Residential Pipe Standards.
- Channel Impact (peak flow)
- Basin Impact (flood and water quality volume)
- Reduce Fee for Parks and Schools

Commercial versus Residential

The County Improvement Standards have two pipe design curves, residential and commercial. Commercial includes dense residential and industrial, while the residential curve is used for parks and schools. The following will compare these two design curves to determine the appropriate weighting of the total estimated cost of trunk pipe drainage. Consider a fictitious square 240-acre drainage shed in Nolte zone 3:

Table A3 – Nolte Method

ZONE 3 "NOLTE METHOD"						
PIPE	LENGTH (ft)	SHED	RESIDENTIAL		COMMERCIAL	
A	1616	30ac	7.5cfs	21"	15cfs	27"
B	1616	90ac	32cfs	36"	42cfs	42"
C	1616	30ac	7.5cfs	21"	15cfs	27"
D	808	210ac	106cfs	54"	124cfs	60"

Figure A3 – Pipe Schematic

Total Estimated Cost Of Trunk Pipe Drainage Calculation
(Based on the Nolte Method – Zone 3 shown above)

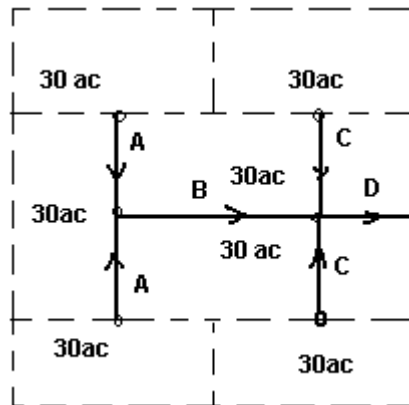


Table B3 – Commercial vs. Residential

COMMERCIAL			RESIDENTIAL		
27"	3232 ft	\$ 157,722	21"	3232 ft	\$ 124,109
42"	1616 ft	\$ 135,906	36"	1616 ft	\$ 99,287
60"	808 ft	\$ 92,564	54"	808 ft	\$ 83,062
<i>Total</i>		<i>\$ 386,192</i>	<i>Total</i>		<i>\$ 306,458</i>

\$386,192 divided by \$306,458 equals 1.26. Therefore, one can see that the impact to trunk pipe drainage is 26% greater for commercial development than that required for residential developments.

Channel Impacts

To determine the channel component impact of various development types based on impervious area, a small shed area of 160 acre was considered. This shed area seems to be typical of pipe conveyance to an open channel. The peak 100-year flow for the average imperviousness (41.94% per Table D3) was used to compare the peak flow impact of each type of development ranging from 15% to 90% impervious area.

Table C3 – HEC-1 Output ^[1]

Impervious Area	Peak Flow (cfs)
5%	158.5
15%	246.1
20%	255.3
30%	279.2
40%	296.1
50%	306.4
60%	321.5
70%	333.8
80%	346.4
90%	358.6

Note

1. Sacpre Zone 2 at elevation 100'
2. 160-Acres of Soil C
3. L=2640', Lc=1320'

HEC-1 output, for various impervious area percentages, is contained in Table C3 for a 160-acre square shed with soil Type C, a slope of 0.50%, at elevation 100 feet. The weighted impact is determined by centering over the 41.94% impervious area "average development", 298.1 cfs (interpolated) peak flow.

Table D3 –Peak 100-Year Flow for the Average Imperviousness

% impervious area	peak flow (cfs)	volume exceeding 10yr (ac-ft)	channel impact	volume impact
15%	246.1	1.23	82.55%	55.04%
20%	255.3	1.40	85.64%	62.87%
30%	279.2	1.88	93.68%	84.29%
40%	296.1	2.19	99.32%	98.24%
50%	306.4	2.39	102.80%	107.32%
60%	321.5	2.65	107.86%	119.19%
70%	333.8	2.87	111.98%	128.80%
80%	346.4	3.09	116.20%	138.62%
90%	358.6	3.29	120.29%	147.60%
41.94% *	298.1	2.23		

* calculated by interpolation.

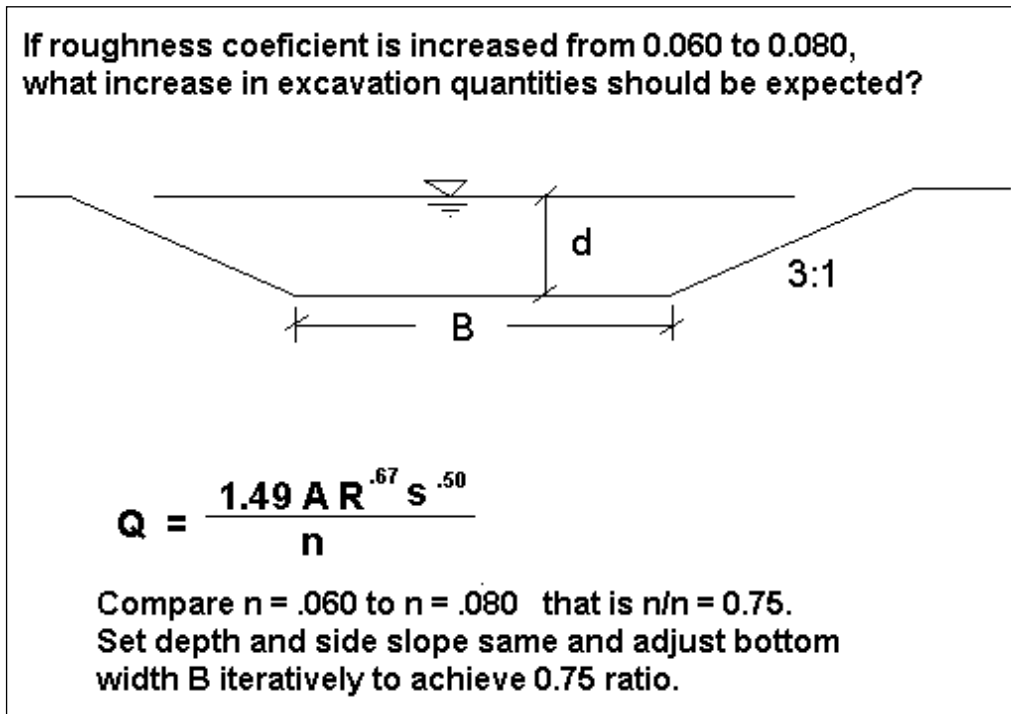
For example, if the entire 160-acre shed is made up of development that is 20% impervious, the peak flow is 255.3 cfs which is 85.64% ($255.3 \div 298.1$) of the peak flow impact compared to what it would be if the area was all developed at 41.94% imperviousness. Likewise, if it is all developed at 80%, the impact is 116.20% of that of the average development. These results are tabulated in Table D3.

Impact of increased Manning's n-value

Due to various state and federal wildlife regulations and a desire of many to maintain drainage channels and creeks to a minimum level to allow for habitat, and pursuant to the updated County Improvement Standards, the Manning's roughness coefficient (n-value) will typically be 0.080. This is an increase from the previous 0.060 that was used as a basis for the 1996 Fee Plan channel component.

Starting with a bottom width B1 and calculating the wetted perimeter P1 and the hydraulic cross sectional area A1 and the area times the 2/3 root of the hydraulic radius (R1) then by iterating B2 until the resultant ratio of A times the 2/3 root of R is 0.75, one may solve for the cross sectional area A2 and determine the increased excavation quantity, due to increasing the Manning's n-value from 0.060 to 0.080 (described in the Figure B3). Table E3 is a compilation of channels 6 feet and 8 feet deep with bottom widths of 10 feet to 100 feet.

In the first example, a 6' deep channel is 10 feet wide at the bottom if $n=0.060$. Increasing n to 0.080 increases the bottom width to 17.3' and the cross sectional area by 26% (B2 was manually input into the Excel spreadsheet until the ratio on the right came to 0.75).

Figure B3 – Manning's Calculation

Looking at the comparisons on Table E3, the average is $(1.31+1.31+1.28+1.29+1.26+1.26)/6 = 1.29$. Therefore, it is found that there is an average 29% increase in the cost of channel excavation quantities due to increasing Manning's n -value from 0.060 to 0.080. It is noted that not every channel will be built at 0.080, but there will be an overall proportionate increase in roughness coefficients for constructed channels.

Volume Impacts

To determine the volume impact of various development types based on impervious area, a small shed of 160-acre was considered, as it was for channel impacts. The 100-year flow was calculated using the Sacramento Method and HEC-1 software assuming soil type C, 0.50% slope, elevation 100' and a square 160-acre drainage shed area in Sacramento hydrology zone 2.

One may assume that in almost every case the 10-year flow can be conveyed without consequence. Volume impacts, therefore, are not a concern until a storm exceeds the 10% annual recurrence level. For this study, the Sacramento 10-year flow was calculated and the volume above this flow was determined (see Table F3).

The countywide average impervious area (Table D3) of 41.94% contributes 2.23 acre feet (interpolated) of volume above the 10-year flow. The impact of a range of impervious area percentages was developed centered around this average. That is, if the 160-acre shed is developed at 15% impervious area, the volume impact is 55.0% of that of the average development. While an 80% impervious development is 38.6% greater than the average $(3.09AF \div 2.23AF)$.

It is recognized that not every shed will require peak flow attenuation; however, this comparison is deemed appropriate when considering how to best spread the cost of volume mitigation over an entire Zone.

Table E3 - Compilation of Channels

BOTTOM WIDTH		AREA		WETTED PERIMETER		AR ^{0.67}	RATIO
Depth 6'							
B1=	10.0	A1=	168.0	P1=	46.0	400.1	
B2=	17.3	A2=	211.8	P2=	53.3	533.8	0.75
			126%				
B1=	50.0	A1=	408.0	P1=	86.0	1157.9	
B2=	70.0	A2=	528.0	P2=	106.0	1548.3	0.75
			129%				
B1=	100.0	A1=	708.0	P1=	136.0	2138.4	
B2=	136.0	A2=	924.0	P2=	172.0	2850.2	0.75
			131%				
Depth 8'							
B1=	10.0	A1=	272.0	P1=	58.0	766.0	
B2=	18.8	A2=	342.4	P2=	66.8	1023.5	0.75
			126%				
B1=	50.0	A1=	592.0	P1=	98.0	1975.4	
B2=	71.0	A2=	760.0	P2=	119.0	2632.3	0.75
			128%				
B1=	100.0	A1=	992.0	P1=	148.0	3548.9	
B2=	138.0	A2=	1296.0	P2=	186.0	4758.6	0.75
			131%				

Notes:

1. Middle Branch Strawberry Creek was the basis for the Green Book (1996 Fee Plan) analysis, with an "n" of 0.060, per Heidi Huber (County DWR staff).
2. B2 is input iteratively until the ratio becomes 0.75
3. If Manning's "n" value is increased from 0.060* to 0.080, the effect is as follows

Table F3 –Peak 100-Year Flow for the Average Imperviousness

Impervious Area	Volume above 10-year (acre-feet)
15%	1.23
20%	1.40
30%	1.88
40%	2.19
50%	2.39
60%	2.65
70%	2.87
80%	3.09
90%	3.29

Note:

1. SacPre Zone 2, elevation 100', Slope 0.50%
2. Soil type C, 160 acres
3. L=2640', Lc=1320'

Possible Reduced Fee for Parks and Schools

The following is a comparison of impacts from the spreadsheets titled Summary of Component Impact for Zones 11A, 11B, and 11C. Schools and parks typically fall within the 20% to 50% impervious area range. As one can see, the average impact exceeds 50%. This serves to justify the reduction in fees when schools and parks include peak flow and volume attenuation in their grading plans, pursuant Section 2.50.050.

Table F3 –Peak 100- Summary of Component Impact

	PEAK FLOW	VOLUME	BASIN REAL ESTATE	SUM
50% Impervious Area				
11A	21.00	15.75	32.10	68.85
11B	23.76	11.24	17.54	52.54
11C	47.67	9.79	21.03	78.49
Average	30.81	12.26	23.56	66.63
20% Impervious Area				
11A	17.49	9.23	18.80	45.52
11B	19.79	6.58	10.28	36.65
11C	39.72	5.73	12.52	57.97
Average	25.67	7.18	13.87	46.71
Average 20% and 50% Imp Area				
11A	19.25	12.49	25.45	57.19
11B	21.78	8.91	13.91	44.60
11C	43.70	7.76	16.78	68.23
Average	28.24	9.72	18.71	56.67

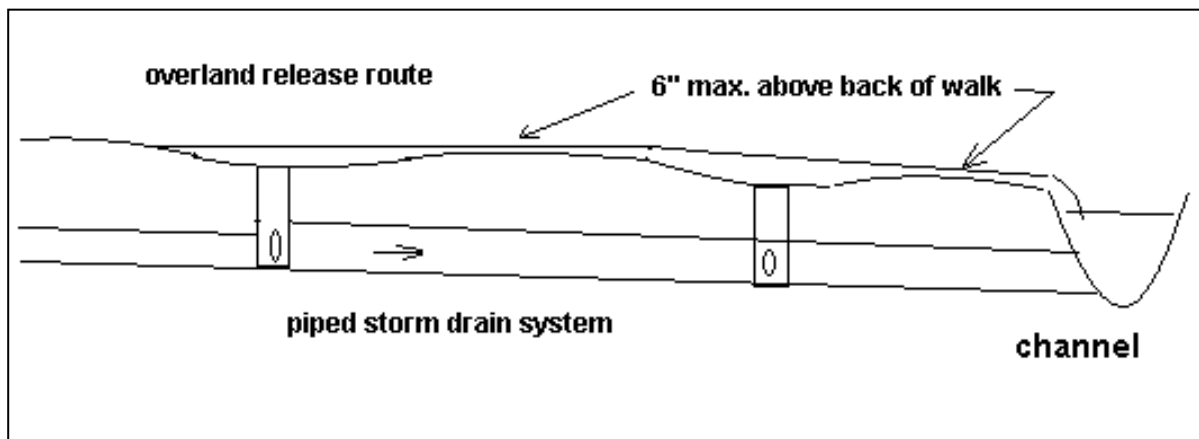
APPENDIX 4 PIPE SIZING ANALYSIS

This appendix continues forward pursuant to the 2004 Fee Plan.

Impact of Section 9-16C on Pipe Sizes

Pipes are designed to convey a finite flow; however, sometimes nature delivers bigger storms. During these high intensity storms, piped storm drain systems may become overwhelmed. Inlets surcharge, storm water ponds in low areas until they are full and flows over land to creeks, streams, basins, channels and ditches. The depth of the over-land flow in the street can be calculated and the building can safely be constructed above the 100-year water surface; however, there is a concern about the depth of flowing water in a street (see figure below). In the 2002 revision to the Drainage Improvement Standards, the Department of Water Resources added Section 9-16C, as follows:

Figure A4 – Overland Flow



Overland flow passing over street vertical curves shall not exceed a depth of six inches over the back of walk.

Flow versus depth was calculated using normal flow and Manning's Equation. This relationship for a 40' wide street right of way is graphically represented in Figure B4, "Overland Release 40' Right of Way half section street flow". This is presented in Table B4.

Manning's equation was used, assuming normal flow in full pipes, to determine pipe sizes based on the Sacramento County Improvement Standards (aka. the Nolte runoff curves). The 100-year curves in the Sacramento City/County Volume 2 Hydrology Standards were used to determine the 100-year runoff. Table A4 is a list of various shed areas, the design capacity of the trunk pipe and the 100-year storm runoff, for the purposes of this comparison.

The goal of this section is to determine in what topographic areas Section 9-16C has the most impact, requiring increased pipe size and to what extent this may be an additional cost in the Fee Plan.

Figure B4 – Overland Release

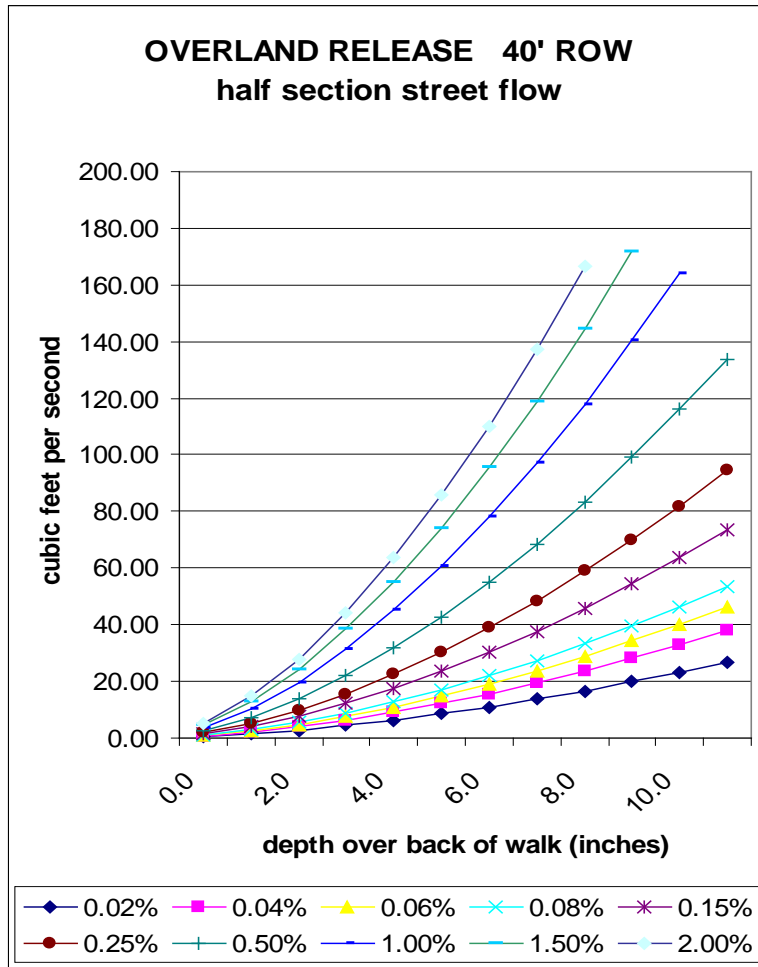


Figure C4 – Estimate Pipe Capacity

Full flow pipe, no pressure, normal flow conditions

$$Q = \frac{1.49 A R^{.67} s^{.50}}{n} \Rightarrow d = \left(\frac{Q}{30.82 s^{.5}} \right)^{0.375}$$

Manning's n = .015
Q = flow in pipe (cfs)
A = cross sectional area (sf)
R = wetted perimeter A/p
p = pipe circumference (ft)
s = longitudinal slope (ft/ft)

Figure D4 – Nolte Chart

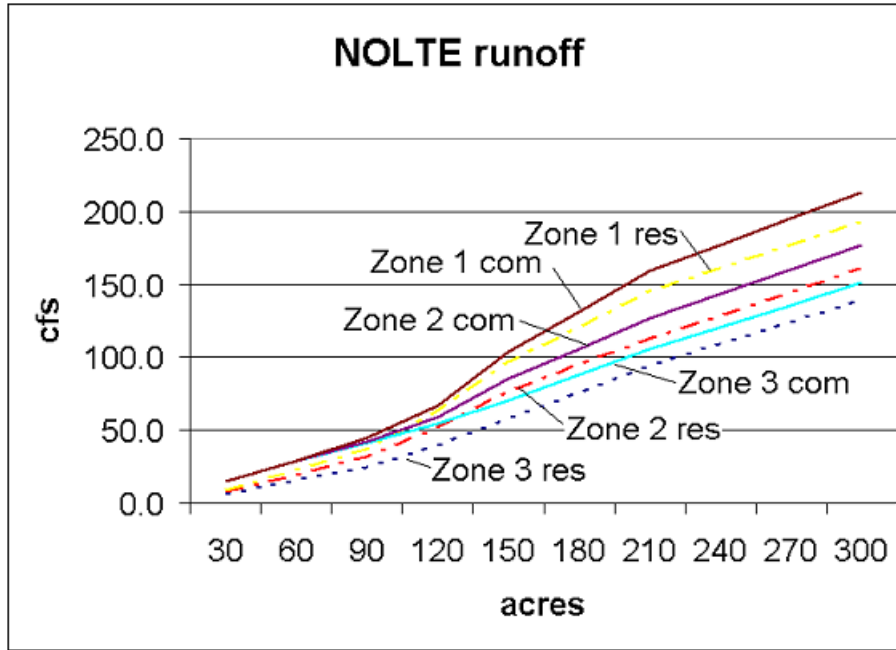


Table A4 –Flow in the Pipe

Acres	Flow Nolte (zone 3)	100-yr	Overland (cfs)
20	6.0	23.2	17.2
40	12.0	46.4	34.4
60	18.0	69.6	51.6
80	24.0	92.8	68.8
100	30.0	116.0	86.0
120	36.0	139.2	103.2
140	42.0	140.0	98.0
160	48.0	160.0	112.0
180	54.0	171.0	117.0
200	60.0	182.0	122.0
220	66.0	200.2	134.2
240	72.0	218.4	146.4
260	78.0	236.6	158.6
280	84.0	249.2	165.2
300	90.0	255.0	165.0

Table B4 – Flow versus Depth
(40' wide street right of way)

d BOW (inch)	T (ft)	Q (cfs) per Longitudinal Slope									
		0.02%	0.04%	0.06%	0.08%	0.15%	0.25%	0.50%	1.00%	1.50%	2.00%
0.0	13.1	0.69	0.98	1.20	1.39	1.90	2.45	3.46	4.90	6.00	6.93
0.0	13.1	0.53	0.75	0.92	1.06	1.45	1.88	2.65	3.75	4.59	5.30
1.0	15.2	1.48	2.09	2.56	2.96	4.05	5.22	7.39	10.45	12.80	14.78
2.0	15.2	2.79	3.95	4.84	5.59	7.65	9.88	13.97	19.76	24.20	27.94
3.0	15.2	4.43	6.27	7.68	8.86	12.14	15.67	22.16	31.34	38.38	44.32
4.0	15.2	6.36	9.00	11.02	12.73	17.42	22.50	31.81	44.99	55.10	63.63
5.0	15.2	8.56	12.11	14.83	17.13	23.46	30.28	42.82	60.56	74.17	85.65
6.0	15.2	11.02	15.59	19.09	22.05	30.19	38.97	55.12	77.95	95.46	110.23
7.0	15.2	13.73	19.41	23.77	27.45	37.59	48.53	68.63	97.05	118.86	137.25
8.0	15.2	16.66	23.56	28.86	33.32	45.62	58.90	83.30	117.80	144.28	166.60
9.0	15.2	19.82	28.03	34.33	39.64	54.28	70.07	99.09	140.14	171.64	198.19
10.0	15.2	23.19	32.80	40.17	46.39	63.52	82.00	115.97	164.01	200.87	231.94
11.0	15.2	26.78	37.87	46.38	53.56	73.34	94.68	133.90	189.36	231.92	267.80

NOTE: Cross slope =2.00%; Half of 40' wide street section; Back of Walk (BOW)

The following examples assume constant slopes, flat super elevations, normal flow and neglecting ponding, but the serve well for comparison purposes.

Example #1: A 100 acre residential drainage shed, in Nolte Zone 3, must pipe 30cfs while the 100-year runoff is 116cfs. The remaining 86cfs must flow overland, down the gutter at 43cfs on each side. This flow can be conveyed at a depth less than 6" in the gutter if the longitudinal slope is greater than about .31%. However, if the slope is flatter, a large pipe will have to be installed to reduce the overland flow.

Example #2: For a sample 160-acre shed, the excess runoff in 100-year storm is 56.0 cfs flowing down each gutter. In this case, the longitudinal slope must be greater than 0.54%. If the slope is only 0.15%, the depth above back of walk is calculated at 9.2"; therefore, a larger pipe will be required.

Tables C4 is a compilation of pipe design flows (Nolte Method) for fictitious shed areas using impervious area of 50% in zone 3 (Figure 2-6 and 2-9 of the Sacramento City/County Hydrology Standards). The 100-year flow was taken from the charts for Sacramento Method (Figures 2-20 and 2-21 of the Hydrology Standards). Notice that 'Nolte' and Sacramento Method have different 'zones' (see maps, Figures 2-4 and 2-11 of the Hydrology Standards).

Subtracting the 100-year flow from the pipe design flow and dividing by two gives the half street flow. Comparing this flow to Table B4 and interpolating, gives the required longitudinal street slope if the flow is to be limited as required by Section 9-16C of the Improvement Standards. Assuming the pipe flow is normal and the pipe is sloped parallel with the street, the pipe size is determined (not used in these calculations other than to indicate the range of trunk pipes being considered). One might reasonably assume that a typical pipe outfall is 48" diameter, in this example serving 160-acres. At a slope of 0.32% the 100-year flow can be safely conveyed to the open channel. This is typical in Zones 11B and 11C, but Zone 11A is often flatter.

Table C4 – Pipe Design Flow
(Nolte Method)

Acres	Q In The Pipe (zone 3)	100-yr	Overland (cfs)	Q cfs (Half Street)	Required Slope at 6"	Pipe Size Normal Flow (in.)
40	8.0	52.0	44.0	22.0	0.08%	27.6
60	15.0	70.0	55.0	27.5	0.13%	32.0
80	22.0	88.0	66.0	33.0	0.18%	32.8
100	29.0	105.0	76.0	38.0	0.24%	35.4
120	40.5	122.0	81.5	40.8	0.28%	40.1
140	52.0	137.5	85.5	42.8	0.31%	43.1
160	67.0	153.0	86.0	43.0	0.32%	47.1
180	80.0	169.0	89.0	44.5	0.34%	49.9
200	93.0	185.0	92.0	46.0	0.37%	51.9
220	101.6	199.5	97.9	49.0	0.41%	52.7
240	110.2	214.0	103.8	51.9	0.45%	53.4
260	118.8	227.3	108.5	54.3	0.49%	54.0
280	127.4	240.7	113.3	56.6	0.53%	54.5
300	136.0	254.0	118.0	59.0	0.59%	54.9
400	214.5	315.5	101.0	50.5	0.43%	69.0
450	254.0	346.0	92.0	46.0	0.36%	75.9
500	293.0	377.0	84.0	42.0	0.30%	83.1

NOTE: 50% impervious area; Sacramento County Zone 2

Table D4 summarizes the results with street flow limits (from Table B4) for comparison with various longitudinal slopes. For example, a 100-acre shed area has a pipe designed to convey 29cfs and a 100-year runoff flow of 105cfs, the half street flow is 38cfs requiring a slope of .25% to safely convey. Looking at a larger shed area of 220 acres, the pipe conveys 101.6cfs and the half street 100-year overland flow is 49.0cfs, requiring a slope steeper than .38%. Table E4 provides additional example calculations of the effect of 'Section 9-16C.' As one considers the typical shed areas, one can deduce that if the slope is flat, less than 0.25%, the "typical" shed outfall pipe will have to be enlarged in order to convey more flow and to reduce overland flow in the street. Table F4 compares the effect of '9-16C' on trunk drainage cost in various specific plan areas.

Table D4 – Summary Results With Street Flow Limits

Acres	Nolte Q (cfs)	Q <i>half street</i> (overland) (cfs)	Q <i>half street - 6" flow</i> (cfs)	
40	8.0	22.0		
60	15.0	27.5	0.06%	19.1
80	22.0	33.0	0.08%	22.1
100	29.0	38.0	0.15%	30.2
120	40.5	40.8	0.25%	39.0
140	52.0	42.8	0.38%	47.0
160	67.0	43.0	0.50%	55.1
180	80.0	44.5		
200	93.0	46.0		
220	101.6	49.0		
240	110.2	51.9		
260	118.8	54.3		
280	127.4	56.6		
300	136.0	59.0		
400	214.5	50.5		
450	254.0	46.0		
500	293.0	42.0		

Table C4 – Compare Piped Storm Drainage
(Nolte Method)

Compare piped storm drainage required per the proposed revision to Section 9-16C of the Improvement Standards

Longitudinal slope of storm drain pipe and street			
	0.15%	0.25%	0.50%
30" pipe conveys (cfs) ^[1]	13	17	22
Serving (acres) ^[2]	59	77	100
Q-100yr (cfs) ^[3]	69	82	103
Max. Q-Street (cfs) ^[4]	60	80	110
Req'd Q pipe (cfs)	9	2	-
Pipe size Diameter (in) ^[1]	30"	30"	30"
48" pipe conveys (cfs) ^[1]	47	60	85
Serving (acres) ^[2]	132	152	187
Q-100yr (cfs) ^[3]	131	145	175
Max. Q-Street (cfs) ^[4]	60	80	110
Req'd Q pipe (cfs)	71	65	65
Pipe size Diameter (in) ^[1]	55	49	48"
54" pipe conveys (cfs) ^[1]	65	83	118
Serving (acres) ^[2]	159	185	258
Q-100yr (cfs) ^[3]	155	172	223
Max. Q-Street (cfs) ^[4]	60	80	110
Req'd Q pipe (cfs)	95	92	113
Pipe size Diameter (in) ^[1]	62	56	54"
60" pipe conveys (cfs) ^[1]	83	110	150
Serving (acres) ^[2]	185	235	333
Q-100yr (cfs) ^[3]	172	210	279
Max. Q-Street (cfs) ^[4]	60	80	110
Req'd Q pipe (cfs)	112	130	169
Pipe size Diameter (in) ^[1]	66	63	60"

[1] Assuming normal flow using Manning's equation

[2] Using Sacramento County Design Runoff Curve "Nolte Method" Zone 3 Residential

[3] From Sacramento Method Chart Zone 2 at 50% impervious (note that reference to Zone 2 and 3 above are because the pipe design map than the county hydrology map use different zone designations).

[4] Using Table B, assuming standard 2% cross slope and 6" deep over back of walk, normal flow equal on both sides of the street, neglecting ponded volume in the sag areas.

Table F4 – Effect of Proposed Overland Release
 Revision Section 9-16C of The Improvement Standards (Rev December 2002)

Assuming every pipe is in a 40' wide street section with the street as the primary overland release route. (Quantities under old standard)								
Average Pipe Size	East Franklin	Laguna Stonelake	North Vineyard Sta.	Vineyard Springs				
(in)	(ft)	(ft)	(ft)	(ft)	Total (ft)	Priced as Average	2004 Unit Price	Cost
30-33	6320	4302	7298	2,550	20,470	30to33"	\$ 54.62	\$ 1,118,071
36	8340	1772	8724	650	19,486	36"	\$ 61.44	\$ 1,197,220
42	6660	585	3745	480	11,470	42"	\$ 84.10	\$ 964,627
48-54	14720	4752	7505	1,000	27,977	48-54"	\$ 99.80	\$ 2,792,105
60	11580	2652	5230	7,250	26,712	60to72"	\$ 114.56	\$ 3,060,127
							Total Cost	\$ 9,132,150
Quantities if limit overland flow to 6" over back of walk								
	East Franklin	Laguna Stonelake	North Vineyard Station	Vineyard Springs				
inch	feet	feet	feet	feet	feet			
30-33	6320	4302	7298	2,550	20,470	30-33"	\$ 54.62	1,118,071
42	8340	1772	8724	650	19,486	42"	\$ 84.10	1,638,773
48	6660	585	3745	480	11,470	48"	\$ 96.80	1,110,296
60	14720	4752	7505	1,000	27,977	60"	\$ 114.56	3,205,045
66	11580	2652	5230	7,250	26,712	66"	\$ 146.00	3,899,952
								\$ 10,972,137
<i>Estimated increase in trunk pipe due to proposed overland release revision, only in flat areas Zone 11A:</i>								20.1%

It is recognized that pipe size increase is not always necessary and not all of Zone 11A is topographically flat; nevertheless, the impact of this standard is measurable. Reviewing East Franklin, Laguna Stonelake, North Vineyard Station, and Vineyard Springs Specific Plan Areas, pursuant to 9-16C, it was found that large diameter pipes in topographically flat areas will have to be upsized to reduce the 100-year flow in the street, see Table E. For example, a 48" pipe will serve 187 acres if the slope is 0.5%, but if the slope is 0.15% the same 187 acres will require a 66" diameter pipe. Table F concludes that the anticipated impact due to Section 9-16C is 20.1%.

In addition to Section 9-16C of the Improvement Standards, the reader is directed to the introductory paragraph under Section 9-16 in which the design engineer is required to limit the depth of ponding in the street to no more than 8" over back of walk, in the 100-year storm. When considering both of these standards, and the fact that it is desired to maintain passable collector streets in case of emergency, one should be reassured that pipe sizes should increase in many locations.

Recognizing that short of doing a detailed drainage master plan for the build out of Zone 11A, one is left with a decision of how to handle this apparent need for increase in pipe size. Based on review of the USGS quad map and the aforementioned design standards, it is agreed that the increase should be 56% [as calculated by Bill Owens, County DWR staff, on 8/18/03] of the 26% calculated increase (Table F); therefore a multiplier of $20.1\% \times .56 = 11.3\%$ is used as an addition to the sum of the estimated trunk pipe costs in Zone 11A.

APPENDIX 5 REVENUE VS. EXPENSE PAST FIVE YEARS

Below are revenue, expense, and cash flow statements for each Zone. This analysis will be kept current and the appendix updated annually.

Table A5 – Zone 11A Revenue vs. Expenses
(Zone 11A Summary Past 5-Years)

Zone 11A	Actual FY08-09	Actual FY09-10	Actual FY10-11	Actual FY11-12	Actual FY12-13	Estimate FY13-14
Revenue	\$ 1,802,146	\$ 822,902	\$ 2,529,355	\$ 3,399,551	\$ 2,068,065	\$ 3,063,469
Expenses	\$ 2,199,594	\$ 2,409,552	\$ 2,902,848	\$ 2,376,396	\$ 2,020,261	\$ 7,382,808
Balance	\$ 28,442,587	\$ 27,253,386	\$ 26,879,893	\$ 27,903,047	\$ 27,950,852	\$ 23,631,513

Development activity began increasing December 2013; consequently, the FY2013-14 credits, reimbursements, and right of way acquisition amounts are increased in the budget.

Table B5 – Zone 11B Revenue vs. Expenses
(Zone 11B Summary Past 5-Years)

Zone 11A	Actual FY 08-09	Actual FY 09-10	Actual FY 10-11	Actuals FY 11-12	Actual FY 12-13	Estimate FY13-14
Revenue	\$ 314,019	\$ 294,151	\$ 216,189	\$ 263,234	\$ 263,833	\$ 366,361
Expenses	\$ 658,119	\$ 382,117	\$ 399,363	\$ 508,528	\$ 347,345	\$ 621,855
Balance	\$ 7,230,933	\$ 7,142,967	\$ 6,959,793	\$ 6,714,498	\$ 6,630,987	\$ 6,375,492

The FY2013-14 estimate includes estimated cost for pump station improvement projects.

Table C5 – Zone 11C Revenue vs. Expenses
(Zone 11C Summary Past 5-Years)

Zone 11C	Actual FY08-09	Actual FY09-10	Actual FY10-11	Actual FY11-12	Actual FY12-13	Estimate FY13-14
Revenue	\$ 299,537	\$ 299,616	\$ 106,039	\$ 99,242	\$ 116,304	\$ 496,410
Expenses	\$ 519,621	\$ 404,214	\$ 373,430	\$ 382,402	\$ 189,805	\$ 941,069
Balance	\$ 4,011,031	\$ 3,906,432	\$ 3,639,041	\$ 3,355,881	\$ 3,359,827	\$ 2,915,168

The estimate for FY2013-14 included an increase in credits applied against fees as the real estate economy begins to improve.

APPENDIX 6 PROJECTION OF REVENUE AND EXPENSES

This analysis will be kept current and the appendix updated.

Zone 11A

The Elder Creek and Gerber Creek improvements described in the North Vineyard Station Drainage Master Plan are permitted under the Clean Water Act and the work will be reimbursement heavy for the first several years.

There are many other opportunities for development in this fee zone and there is no accurate way to estimate which developments will go first and how the fee revenue versus reimbursement expenses will occur. Section 2.60 requires amortization of large reimbursement agreements so the actual yearly cash flow may not be as shown.

Zone 11A accumulated a significant fund balance during the building boom of 2002 to 2007 and held those funds through the recession years of 2008 to 2013. Looking forward to development activity increasing, one must estimate the reimbursement load as trunk drainage facilities are constructed in the planning areas. The new development areas require installation of large trunk drainage facilities, potentially bearing significant reimbursement exposure. Later development projects will infill and pay a greater percentage of the Zone 11A fee in cash. These projections should be monitored each year as budgets are prepared.

Table A6 – Zone 11A 5-year Projections

Zone 11A projection	Total Estimate Trunk Drainage Credit Agreement Amount					
	FY14-15	FY15-16	FY16-17	FY17-18	FY18-19	FY19-20
North Vineyard Station	\$2,000,000	\$2,000,000	\$2,000,000	\$1,000,000	\$1,000,000	\$1,000,000
Vineyard Springs	\$1,000,000	\$500,000	\$500,000	\$300,000	\$100,000	\$100,000
Laguna Ridge	\$300,000	\$200,000	\$200,000	\$100,000	\$100,000	\$100,000
East Elk Grove	\$200,000	\$200,000	\$200,000			
Infill Developments	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000
Elk Grove	\$500,000	\$500,000	\$1,000,000	\$1,000,000	\$500,000	\$300,000
Florin Vineyard Gap	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
Newbridge			\$500,000	\$500,000	\$500,000	\$500,000
Jackson Township			\$1,000,000	\$1,000,000	\$500,000	\$300,000
Mather Specific Plan				\$1,000,000	\$500,000	\$300,000
SUM Trunk Credit Estimate	\$4,800,000	\$4,200,000	\$6,200,000	\$5,700,000	\$4,000,000	\$3,400,000
Reimbursement Balance in Rancho Cordova ^[1]	\$1,188,000	\$1,188,000				
Estimated Credits Used (70%) ^[2]	3,360,000	\$2,940,000	\$4,340,000	\$3,990,000	\$2,800,000	\$2,380,000
Estimated (encumbered) Reimbursement	\$2,628,000	\$2,448,000	\$1,860,000	\$1,710,000	\$1,200,000	\$1,020,000
Cash Fee Revenue (infill) ^[3]	\$1,000,000	\$1,100,000	\$1,100,000	\$1,331,000	\$1,464,100	\$1,610,510
Check total fee estimate ^[4]	\$4,360,000	4,040,000	\$5,550,000	\$5,321,000	\$4,264,100	\$3,990,510
Acres of Development Each Year:	289	268	368	352	282	264

Notes:

[1] Approximate reimbursement balance (+10% estimated interest cost)

[2] Assumed 70% of fees covered by credits with remaining shown as reimbursements due

[3] Cash fees from infill developments estimated based on history plus 10% increase each year coming out of recession years

[4] Total fees is sum of [2] and [3], used here only to calculate estimated acres of development each year.

Projection estimates based on the assumptions described above. Table B6 and Figure A6 will be maintained annually and this appendix will be edited.

Table B6 – Zone 11A Revenue vs. Expenses
(5-Year Projection)

Zone 11A	FY14-15	FY15-16	FY16-17	FY17-18	FY18-19	FY19-20
Revenue	\$ 4,360,000	\$ 4,040,000	\$ 5,550,000	\$ 5,621,000	\$ 4,564,100	\$ 4,290,510
Expenses	\$ 9,512,775	\$ 8,200,213	\$ 8,540,180	\$ 8,068,985	\$ 5,598,655	\$ 5,029,214
Balance	\$ 18,478,737	\$14,318,524	\$11,328,344	\$ 8,880,359	\$ 7,845,805	\$ 7,107,101

Figure A6 – Zone 11A Projection Chart
(Based on Table B6)



Zone 11B

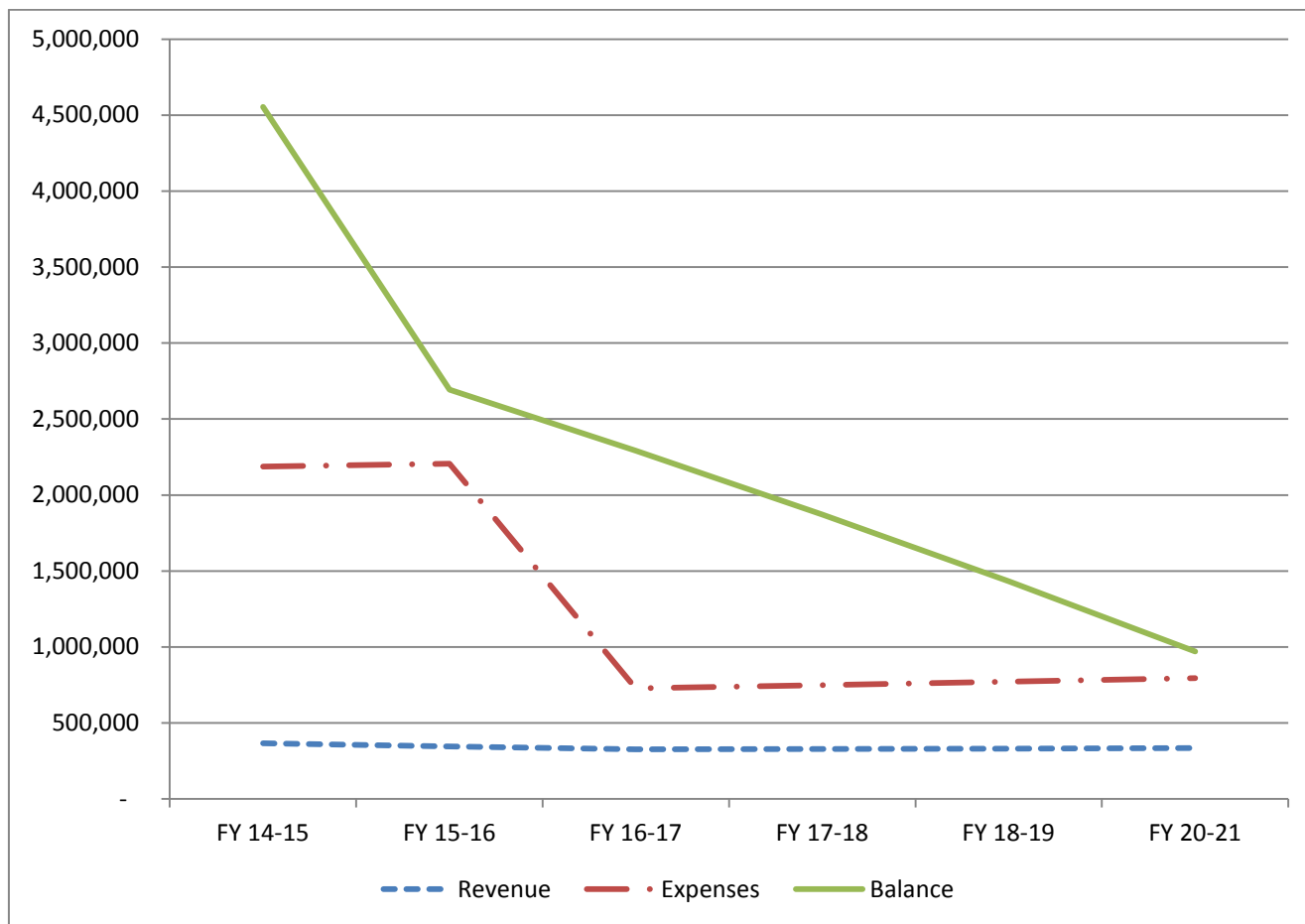
Development opportunities in Zone 11B are limited to infill and redevelopment. Fees are charged for calculated increases impervious area, consequently, there will be a revenue stream continuing over the next many years. The following chart is based on an estimated \$3,5329,000 contribution to the pump station upgrade project. The revenue is based on a nominal 30 acres per year of development at the (average) RD5 fee rate with an average of \$54,000 per year in credits of which a nominal 20 percent is reimbursement cost. The average cash fee revenue is estimated at an average of \$237,000 per year.

The projections should be monitored year over year to assure that the fund balance does not sink too low.

Table C6 – Zone 11B Revenue vs. Expenses
(5-Year Projection)

Zone 11B	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 20-21
Revenue	\$ 365,584	\$ 346,371	\$ 326,804	\$ 329,375	\$ 331,916	\$ 334,422
Expenses	\$ 2,186,350	\$ 2,206,940	\$ 728,148	\$ 749,993	\$ 772,493	\$ 795,667
Balance	\$ 4,554,726	\$ 2,694,157	\$ 2,292,812	\$ 1,872,195	\$ 1,431,617	\$ 970,372

Figure B6 – Zone 11B Projection Chart
(Based on Table C6)



Zone 11C

The largest proposed development in Zone 11C is the Elverta Specific Plan in which Countryside is included. There are also opportunities to continue residential development in East Antelope, Barrett Ranch, and the area of Fox Creek. Zone 11C has much unimproved commercial and industrial land that may infill over time.

The fund balance is currently healthy, however as one can see from the estimate below, if development activity picks up in the fee zone the fund balance may begin to sink.

For the purposes of this analysis, the reimbursements are assumed to be 30 percent of the trunk drainage cost, and cash fee revenue is estimated to grow at a steady rate. Section 2.60 requires amortization of large reimbursement agreements so the actual yearly cash-flow may not be as shown.

It is important to watch this fund very carefully as the Elverta Specific Plan project breaks ground.

Table D6 – Zone 11C 5-year Projections

Zone 11C projection	Total Estimate Trunk Drainage Credit Agreement Amount					
	FY14-15	FY15-16	FY16-17	FY17-18	FY18-19	FY19-20
Elverta Specific Plan ^[1]		1,000,000	\$ 1,000,000	700,000	\$ 500,000	\$ 400,000
Countryside			100,000	100,000	\$ 100,000	
infill East Antelope		50,000	50,000	50,000	\$ 50,000	\$ 50,000
infill Barrett area	\$ 50,000	100,000				
infill Fox Creek area		100,000				
SUM Trunk Credit Estimate	\$ 50,000	\$ 1,250,000	\$ 1,150,000	\$ 850,000	\$ 650,000	\$ 450,000
Estimated Credit Used (70%) ^[2]	\$ 35,000	\$ 875,000	\$ 805,000	\$ 595,000	\$ 455,000	\$ 315,000
Estimated (encumbered) Reimb ^[3]	\$ 15,000	\$ 375,000	\$ 345,000	\$ 255,000	\$ 195,000	\$ 135,000
Cash Fee Revenue (infill) ^[3]	\$ 150,000	\$ 200,000	\$ 250,000	\$ 300,000	\$ 350,000	\$ 400,000
acres of development:	13	73	71	61	54	48

Notes:

[1] Elverta is the largest project with about \$7 million in trunk credits, schedule is unknown

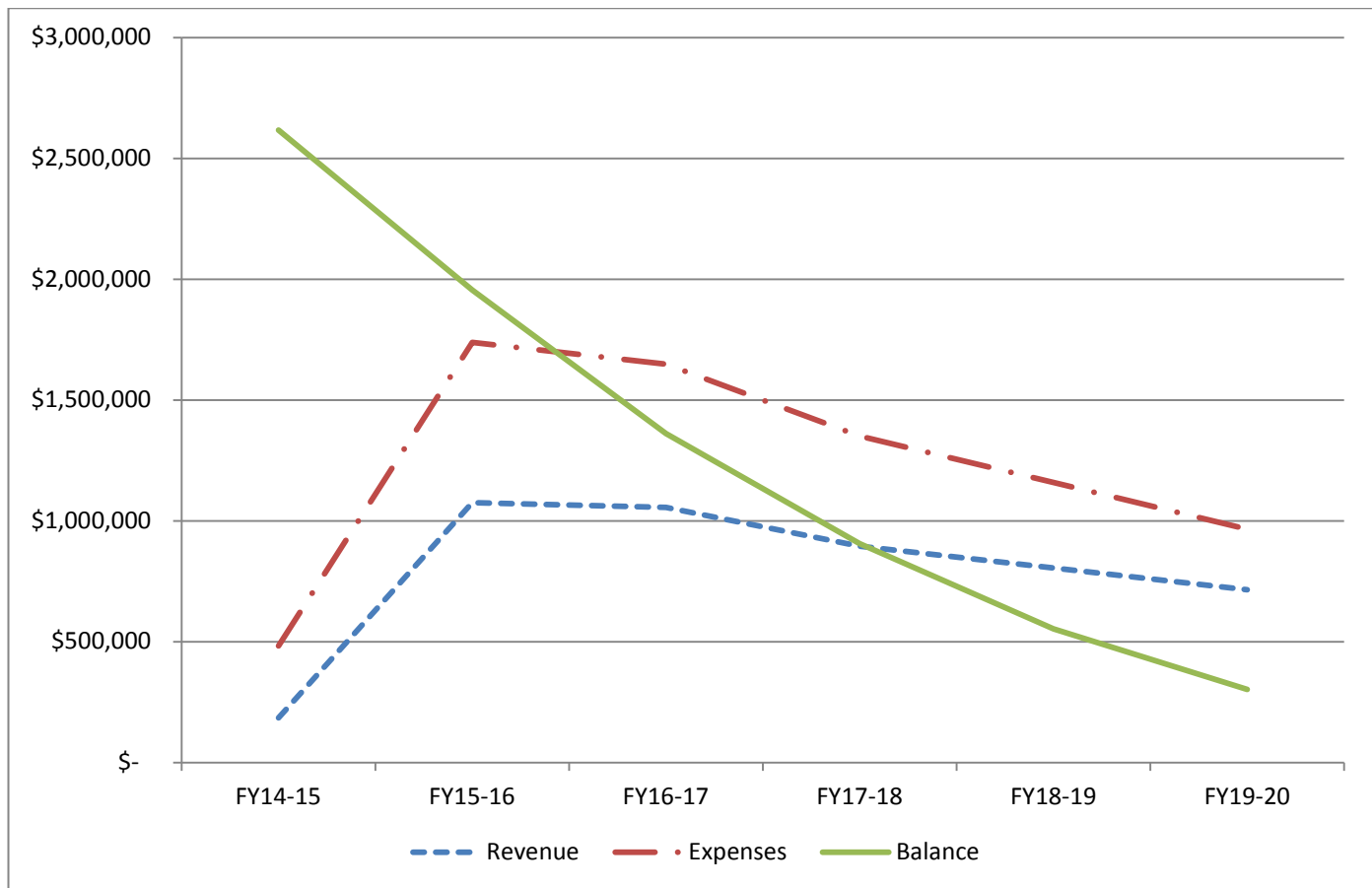
[2] Assumed 70% of fees covered by credits and remaining will be reimbursements due

[3] Reimbursements are taken on the year they are earned although in fact they will be spread over time in accordance with Section 2.60.

Table E6 – Zone 11C Revenue vs. Expenses
(5-Year Projection)

	FY14-15	FY15-16	FY16-17	FY17-18	FY18-19	FY19-20
Revenue	\$ 185,000	\$ 1,075,000	\$ 1,055,000	\$ 895,000	\$ 805,000	\$ 715,000
Expenses	\$ 482,939	\$ 1,737,875	\$ 1,647,698	\$ 1,350,922	\$ 1,158,057	\$ 965,616
Balance	\$ 2,617,229	\$ 1,954,355	\$ 1,361,656	\$ 905,734	\$ 552,678	\$ 302,061

Figure C6 – Zone 11C Projection Chart
(Based on Table C6)



APPENDIX 7 HISTORY OF ZONE 11

Drainage Fee

Figure A7 – Zone 11A Fee History

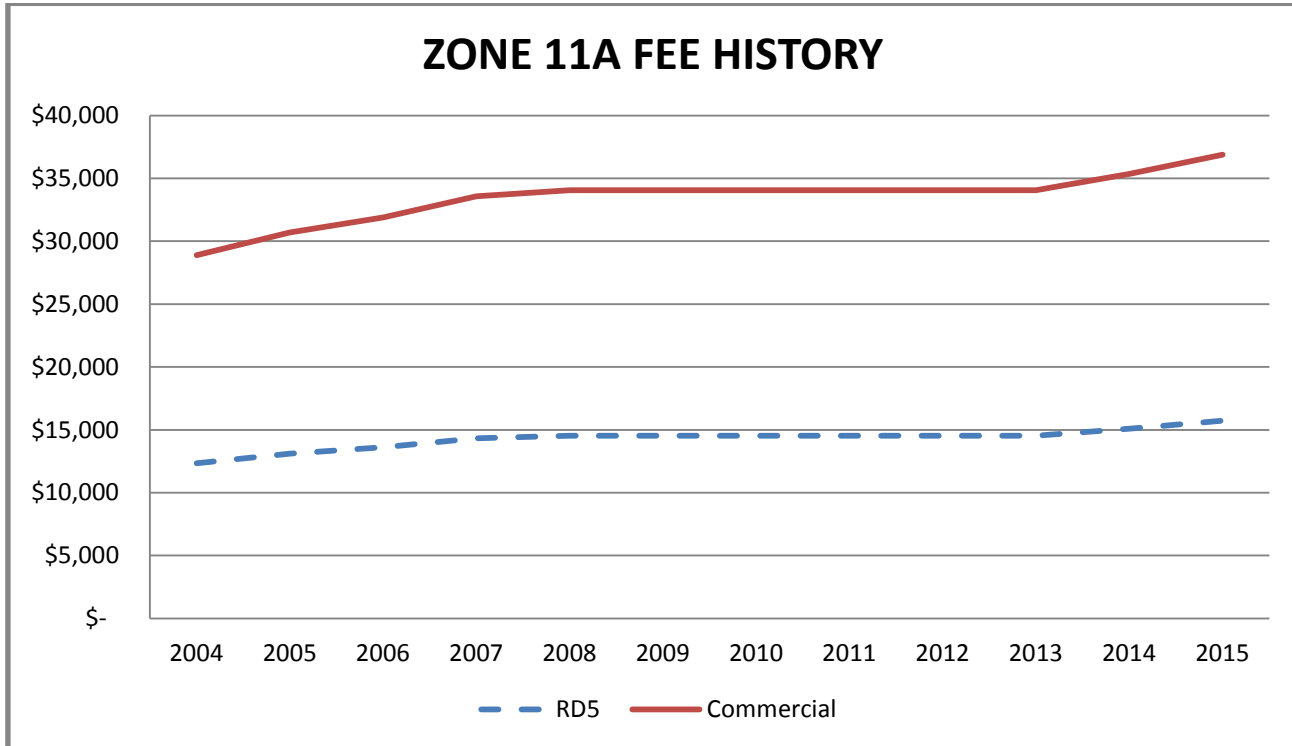


Figure B7 – Zone 11B Fee History

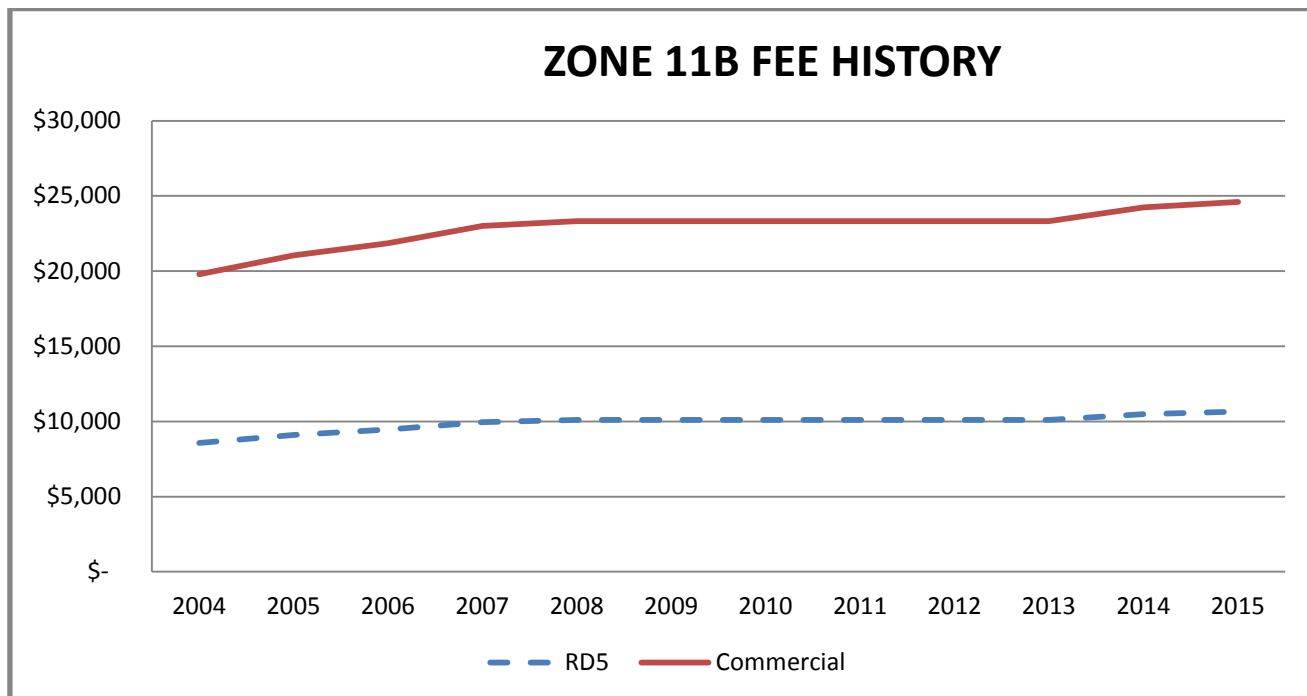
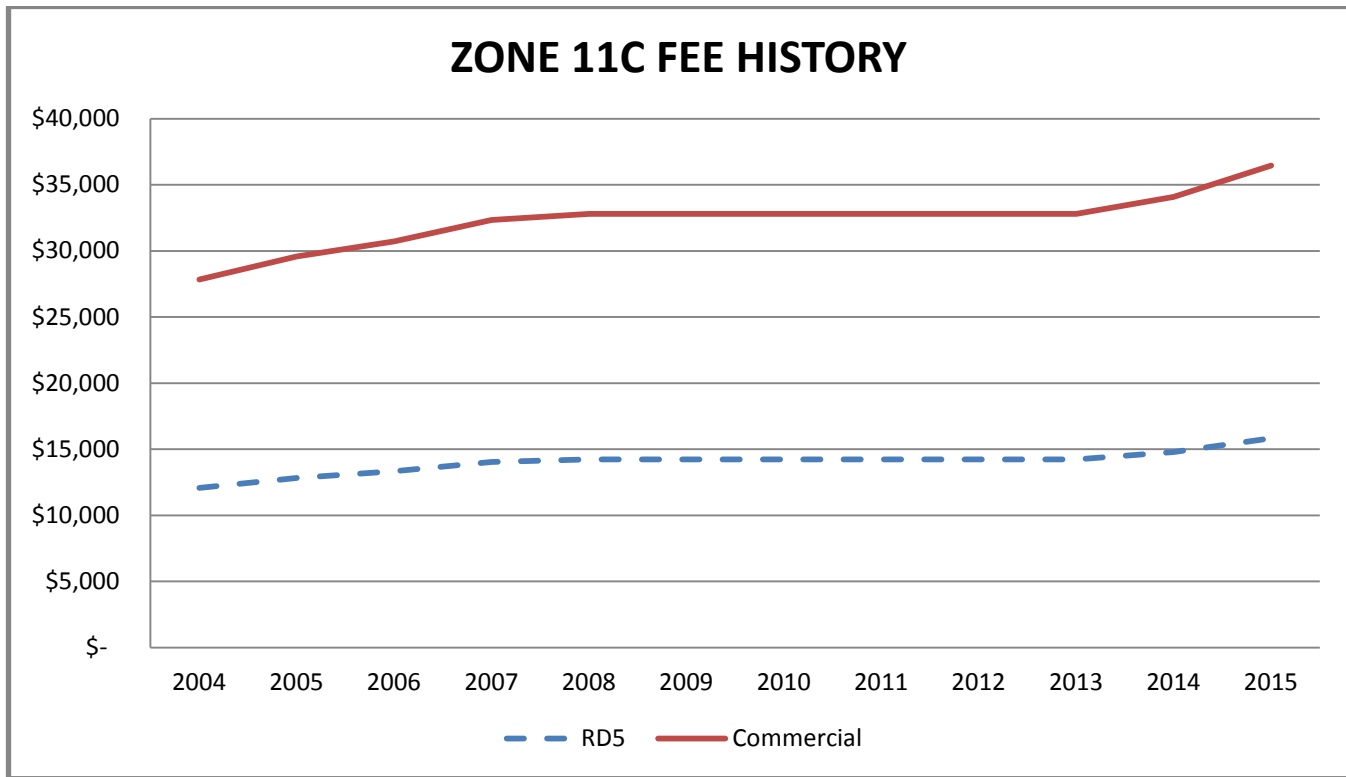


Figure C7 – Zone 11C Fee History



Typical Credit (unit price)

Figure D7 – 36” Pipe Credit (ft)

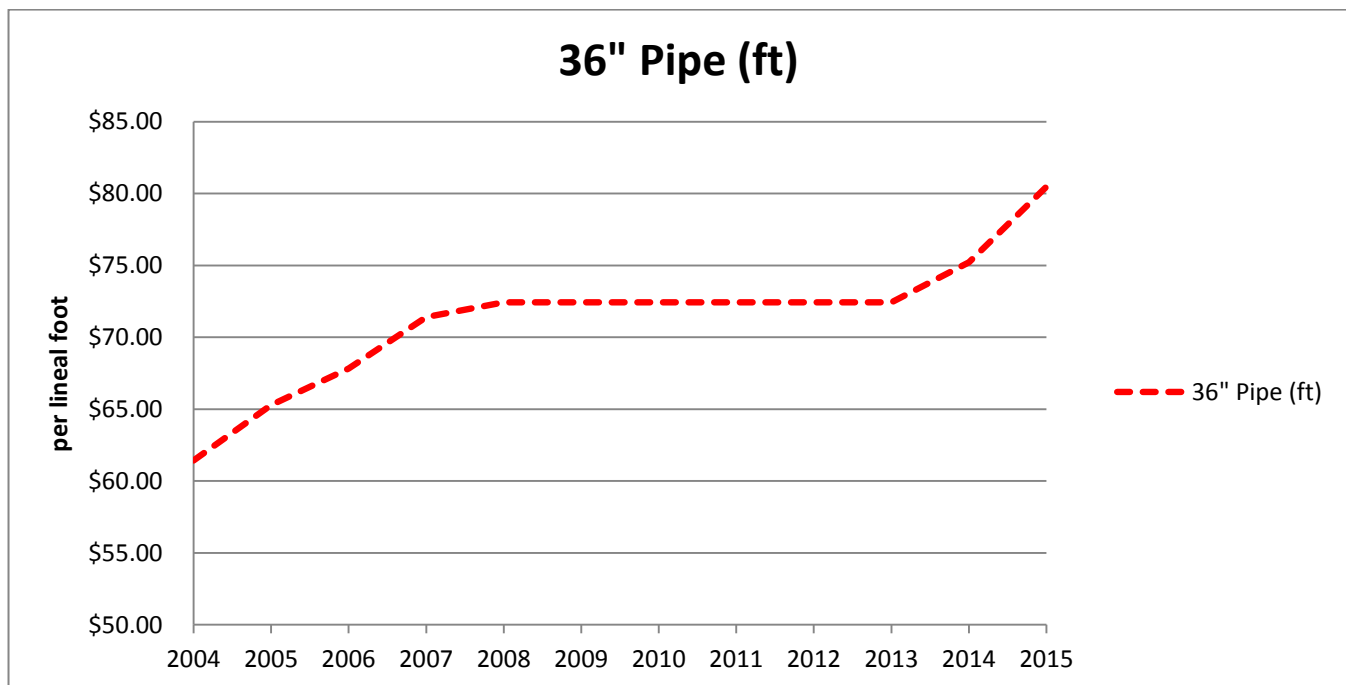


Figure E7 – 72” Standard Manhole Credit (ft)

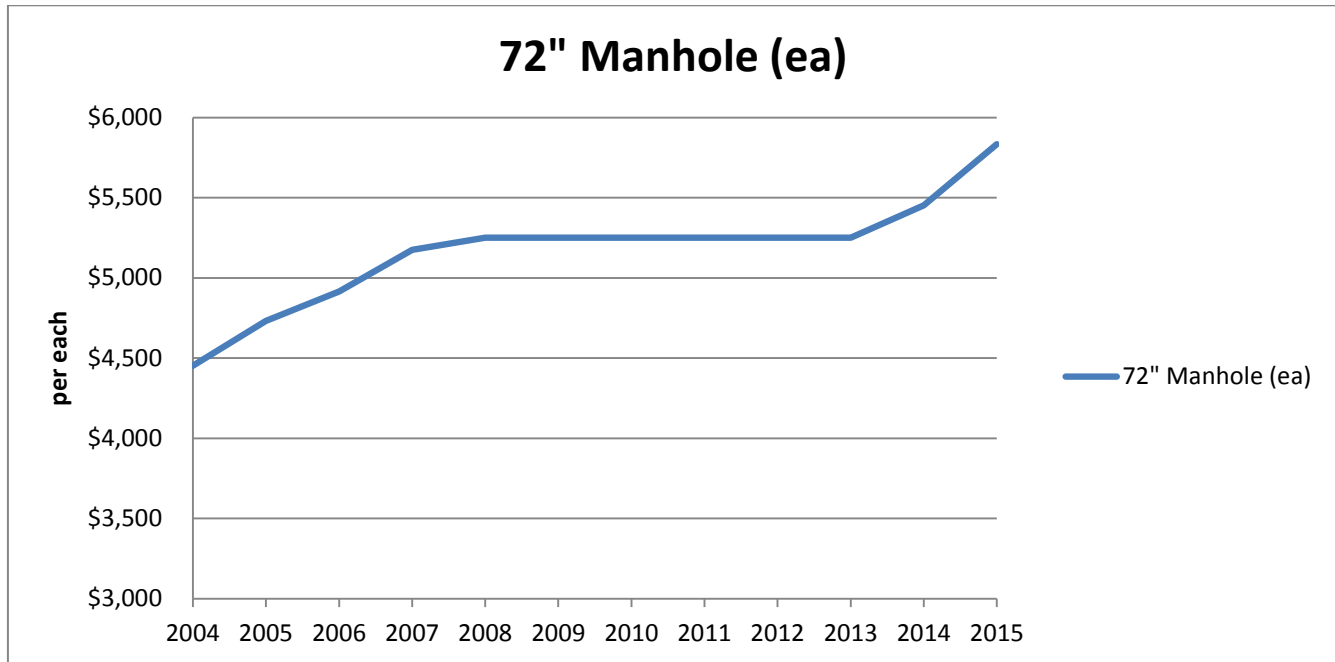
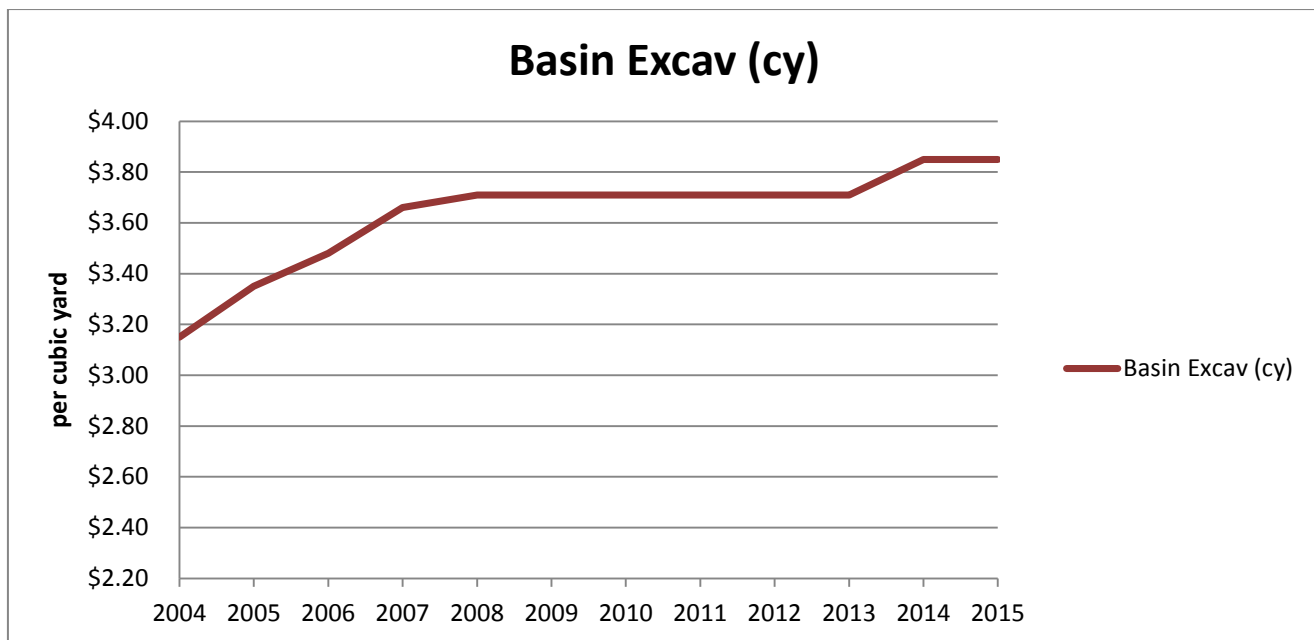


Figure F7 – Basin Excavation (cy)

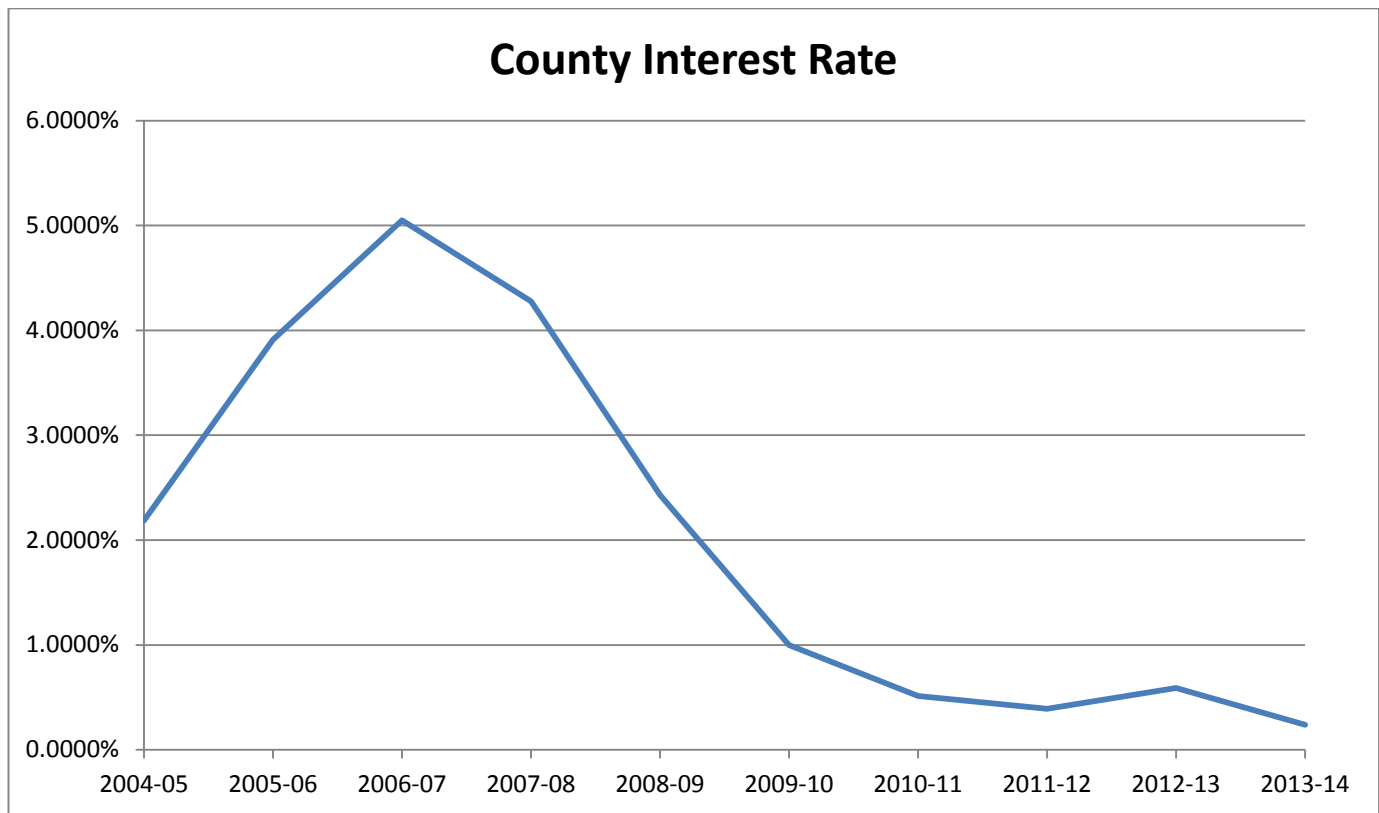


History of County Pooled Interest

Table A7 – History of Interest Rate

	Interest Rate
2004-05	2.1873%
2005-06	3.9096%
2006-07	5.0494%
2007-08	4.2776%
2008-09	2.4310%
2009-10	0.9978%
2010-11	0.5128%
2011-12	0.3901%
2012-13	0.5900%
2013-14	0.2388%

Figure F7 – County Interest Rate



APPENDIX 8 ASSIGNMENT OF CREDIT AGREEMENT TEMPLATE

The following template for assignment of drainage Credit Agreements describes the simplicity of the assignment while each party should assure that the form is adequate for their purposes.

ASSIGNMENT OF DRAINAGE CREDITS [DRAFT]

This Assignment ("Assignment") is made this ____ day of 2____ by and between _____, a _____ ("Assignor") and _____ a _____ corporation ("Assignee"), with reference to the following facts:

- A. WHEREAS, Assignor is the owner of that certain real property located in the County of Sacramento, State of California commonly known as "_____", Assessor's Parcel Number _____ and more particularly described on Exhibit "A" to the Purchase Agreement and attached (the "Property").
- B. WHEREAS, an agreement for trunk drainage credits for Zone 11__ was signed by the Assignor, dated _____ and by the Director of the Sacramento County Department of Water Resources, dated _____, (the "Credit Agreement") pursuant to the Sacramento County Water Agency Code Titles I and II (the "Code").
- C. WHEREAS, the Credit Agreement lists quantities of estimated trunk drainage facilities to be adjusted based upon project completion, pursuant to the Code.
- D. WHEREAS, pursuant to a Purchase and Sale Agreement dated _____, as amended (the "Purchase Agreement"), Assignor has agreed to sell to Assignee all of Assignor's rights, title and interests in and to the Property, including, but not limited to Assignor's right, title, and interest to certain drainage credits applicable to the Property pursuant to the Credit Agreement.
- E. WHEREAS, Assignor and Assignee desire to enter into this agreement to confirm the assignment by Assignor to Assignee of all the Assignee's rights to drainage credits and the Credit Agreement applicable to the Property.

NOW, THEREFORE, in consideration of the mutual covenants of the parties herein, and for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. **Assignment By Assignor.** Pursuant to _____ of the Purchase Agreement, Assignor hereby unconditionally sells, transfers and presently assigns the Credit Agreement to Assignee, without warranty or recourse (except as otherwise provided in this Assignment), all of Assignor's rights, title

and interest in and to the drainage credits applicable to _____ and pursuant to the terms of the Credit Agreement.

- 2. **Indemnity.** Assignor agrees to indemnify the Sacramento County Water Agency and the County of Sacramento and its employees against all liability, claims, damages, losses, costs, or expenses, including attorney fees and court costs, relating to the drainage credits applicable to the Credit Agreement, this Assignment, and the Purchase Agreement.
- 3. **Further Assurances.** Whenever requested to do so by the other party, each party shall execute, acknowledge and deliver any further conveyances, assignments, confirmations, satisfactions, releases, powers of attorney, and any further instruments or documents that are necessary, expedient, or proper to complete any conveyances, sales and assignments contemplated by this Assignment. In addition, each party shall do any other acts and execute, acknowledge, and deliver any requested documents in order to carry out the intent and purpose of this Assignment.
- 4. **Governing Law.** This Assignment is made and entered into the State of California and shall be interpreted, construed and enforced in accordance with the laws of the State of California.
- 5. **Binding Effect.** This Assignment shall apply to, bind, and inure to benefit of Assignor and Assignee, and their respective heirs, legal representatives, successors and assigns.

IN WITNESS WHEREOF, this Assignment has been executed as of the date first above written.

ASSIGNOR:

By: _____

Its: _____

ASSIGNEE:

By: _____

Its: _____

[signatures shall be notarized]