DRE-93

DRAFT – Clad Model and Its Applications

FOY

TABLE OF CONTENTS


| | | |
|---|---|---|
| i | Acknowledgements | i |
| ii | List of Figures | ii |
| iii | List of Tables | iii |
| iv | Abstract | v |
| 1 | INTRODUCTION | 1 |
| 2 | DESCRIPTION OF THE CLAD MODEL | 4 |
| 2.1 | The Discharge Model | 4 |
| 2.2 | STORM Model | 8 |
| 2.3 | Water Quality Computations | 10 |
| 2.4 | CLADM Outputs | 12 |
| 2.5 | Limitations | 13 |
| 3 | INPUT REQUIREMENTS | 13A |
| 3.1 | Input Data | 13A |
| 3.2 | Input Derivations | 16 |
| 4 | APPLICATIONS | 26 |
| 4.1 | Western West Palm Beach Canal (C-51) Basin Plus Levee 8 Basin | 26 |
| 4.1.1 | Discussion | 29 |
| 4.1.2 | Summary Points | 56 |
| 4.2 | Western Tamiami Canal (C-4) Basin with Snapper Creek | 58 |
| 4.2.1 | Discussion | 58 |
| 4.2.2 | Summary Points | 68 |
| 4.3 | Hillsboro Canal + (C-14) Basin | 68 |
| 4.3.1 | Discussion | 68 |
| 4.3.2 | Summary Points | 73 |
| 5 | CONCLUSIONS AND RECOMMENDATIONS | 78 |
| 6 | BIBLIOGRAPHY | 81 |
| 7 | EXHIBITS | 83 |
| 7.1 | Input Set for Western C-51 | 83 |
| 7.2 | CLADM Hydrologic Output for Western C-51 Using 1973-74 and Plan Scenario Land Uses | 87 |
| 7.3 | CLADM Quality Output for Western C-51 Using 1973-74 Land Uses | 91 |
| 7.4 | CLADM Quality Output for Western C-51 Using Plan Scenario Land Uses | 96 |
| 7.5 | Discharges, Nutrient Loadings and Concentrations for an Alternative of Backpumping C-51 and L-8 Using 1973-74 and Plan Scenario Land Uses | 101 |
| 7.6 | Input Set for C-4 Basin | 114 |
| 7.7 | CLAD Model Hydrologic Output for Western C-4 Using 1973-74 and Plan Scenario Land Uses | 118 |
| 7.8 | CLADM Quality Output for Western C-4 Using 1973-74 Land Uses | 123 |
| 7.9 | CLADM Quality Output for Western C-4 Using Plan Scenario Land Uses | 128 |

TABLE OF CONTENTS (continued)


| | | |
|---|---|---|
| 7.10 | Input Set for Hillsboro Basin | 133 |
| 7.11 | CLADM Hydrologic Output for Western Hillsboro Using 1973-74 and Plan Scenario Land Uses | 137 |
| 7.12 | CLADM Quality Output for Western Hillsboro Using 1973-74 Land Uses | 141 |
| 7.13 | CLADM Quality Output for Western Hillsboro Using Plan Scenario Land Uses | 145 |
| 7.14 | Computer Program for the Discharge Model | 149 |
| 7.15 | Computer Program for the Quality Computations | 155 |
| 7.16 | Computer Program for the Summary Output | 160 |

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LIST OF FIGURES


| No. | Title | Page |
|---|---|---|
| 1 | Basin Boundaries of West C-51 (West Palm Beach Canal) and L-8 | 2 |
| 2 | Basin Boundaries of Hillsboro Canal + (C-14) | 2 |
| 3 | Basin Boundaries of West Tamiami Canal (C-4) + Snapper Creek | 3 |
| 4 | Schematics of the Backpumping Alternative | 5 |
| 5 | A Flow Chart of the Discharge Model | 9 |
| 6 | Various Steps of the Quality Calculations | 14 |
| 7 | The Model Inputs and Outputs | 28 |
| 8 | Flow Quantities from Western C-51 Basin for the Data Base Period | 36 |
| 9 | Total Nitrogen Loadings from Western C-51 Basin for the Data Base Period | 45 |
| 10 | Total Phosphorus Loadings from Western C-51 Basin for the Data Base Period | 46 |
| 11 | Historical M-Canal Demands from L-8 | 50 |
| 12 | Flow Quantities from C-4 Basin for the Data Base Period | 62 |
| 13 | Total Nitrogen Loadings from C-4 Basin for the Data Base Period | 66 |
| 14 | Total Phosphorus Loadings from C-4 Basin for the Data Base Period | 67 |
| 15 | Flow Quantities from Hillsboro Basin for the Data Base Period | 72 |
| 16 | Total Nitrogen Loadings from Hillsboro Basin for the Data Base Period | 75 |
| 17 | Total Phosphorus Loadings from Hillsboro Basin for the Data Base Period | 76 |

## LIST OF TABLES


| No. | Title | Page |
|---|---|---|
| 1 | FTU Pollutant Accumulation Rates | 17 |
| 2 | Urban Pollutant Accumulation Rates | 18 |
| 3 | Conversion Table for STORM Loadings | 20 |
| 4 | Illustrative Set of STORM Pollutant Accumulation Rates | 21 |
| 5 | Specific Set of STORM Pollutant Accumulation Rates | 23 |
| 6 | Stormwater Detention Removal Efficiencies | 24 |
| 7 | Land Use Aggregation from the Existing Coding System | 27 |
| 8 | Western C-51 Basin Land Uses | 30 |
| 9 | Pollutant Accumulation Rates for Western C-51 Basin | 32 |
| 10 | Runoff Coefficient Calculations for Western C-51 Basin | 34 |
| 11 | Potential Evaporation Rates | 40 |
| 12 | Surface Water Quality Data for Western C-51 basin | 42 |
| 13 | Flow Quantity and Quality from Western C-51 Basin for the Data Base Period | 44 |
| 14 | Yearly Average Nutrient Concentrations from Western C-51 for the Data Base Period | 47 |
| 15 | Available Backpumping Quantities and Nutrient Loadings from L-8 Basin | 51 |
| 16 | Water Quality Data for L-8 | 55 |
| 17 | Western Tamiami Canal (C-4) Land Uses | 59 |
| 18 | Pollutant Accumulation Rates for C-4 Basin | 60 |
| 19 | Surface Water Quality Data for Western C-4 Basin | 64 |
| 20 | Flow Quantity and Quality for C-4 Basin for the Data Base Period | 65 |
| 21 | Hillsboro Canal Basin and Land Uses | 69 |
| 22 | Pollutant Accumulation Rates for Hillsboro Basin | 70 |

LIST OF TABLES (cont.)

| | | Page |
|---|---|---|
| 23 | Surface Water Quality Data for Hillsboro Basin | 74 |
| 24 | Flow Quantity and Quality for Hillsboro Basin for the Data Base Period. | 77 |

ABSTRACT

The CLAD model is an abbreviation for concentrations, loadings and discharge model. This model was developed to estimate future basin discharges and concentrations of conservative chemical constituents for these discharges. It is a simplistic mass balance model for both quantity and quality. Output is on a monthly basis. The model is deterministic and is rainfall driven. It requires historical discharges for the period of record to be analyzed. The mass balance computations call for the January 1975 version of the Corps of Engineer's STORM model (STORM stands for storage, treatment, overflow and runoff model).

The STORM requires hourly rainfall, land uses and their corresponding pollutant loading rates along with some general basin description parameters.

The CLAD model estimates future discharges by (a) calculating the historical groundwater contributions to discharges (i.e., by subtracting surface runoff of the STORM model from the historical discharges), (b) accounting for changes in groundwater evapotranspiration and surface water evaporation, and (c) adding the net groundwater contributions to the surface water runoff estimated from STORM.

As a part of water quality calculations, the CLAD model estimates the net amount of water quality concentrations from all the historical nonpoint sources and sinks by subtracting surface runoff contributions (as estimated by the STORM model) from the historical water quality data. These monthly concentrations are assumed to be constant in the analysis until further definition can be made. In other words, both historical and future concentrations for all sources and sinks (other than surface water) are assumed to be equal. Using surface runoff, groundwater flow contributions, the surface runoff quality, and quality of the nonpoint sources and sinks, the CLAD model estimates the future water quality of basin discharges.

## 1. INTRODUCTION

There were several water resources planning alternatives that were considered by the South Florida Water Management District while preparing its Water Use and Supply Development Plan for the Lower East Coast Planning Area in South Florida. One of these alternatives is known as the backpumping scheme, where normal eastward flow of excess water to the Atlantic Ocean is reversed by pumping it westward to the conservation areas to increase the water supply capability for the regions of south Florida during the dry period (November through April). This backpumping alternative has several elements associated with it. These elements (including technical, economic, water quality factors, etc.) need to be thoroughly analyzed before an overall impact of the backpumping alternative is assessed. One of the useful inputs is related to the estimation of both quantity and quality of the canal water that will be backpumped to the three conservation areas. In other words, this is a situation where the estimation of the water quantity and quality for future land use scenarios is required at the current time. This type of situation, which is often encountered in water resources planning, demands a reliable mathematical model. To fulfill such a need, the CLAD model was designed. The primary purpose of the CLAD model, as described in this report, is to estimate the quantity and quality of backpumped water that is received from the drainage basin of three lower east coast canals (West Palm Beach Canal basin (C-51 basin), Hillsboro Canal basin and Tamiami Canal basin (C-4 basin)). It should be noted that the model is set up in a manner that is consistent with two other District models: the linear optimization model which analyzes different elements of the backpumping scheme but utilizes the output of the CLAD model and the water quality model. These backpumping alternatives call for building surface water control structures to separate these basins into east and west subbasins, see Figures 1, 2,

WEST PALM BEACH CANAL (C-51)
BACKPUMPING AREA

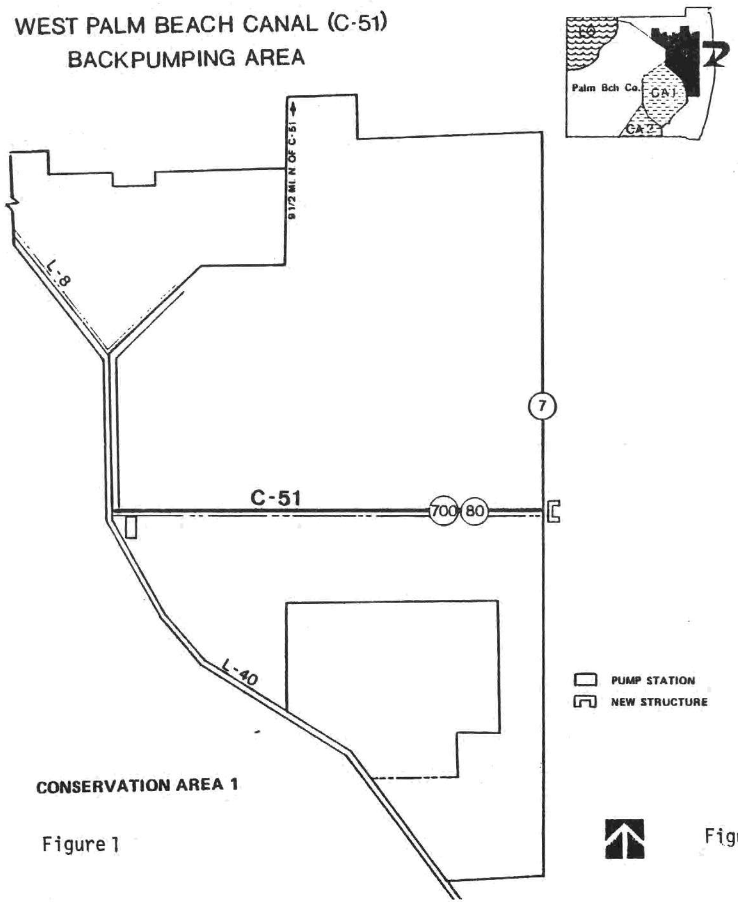



Figure 1

HILLSBORO CANAL

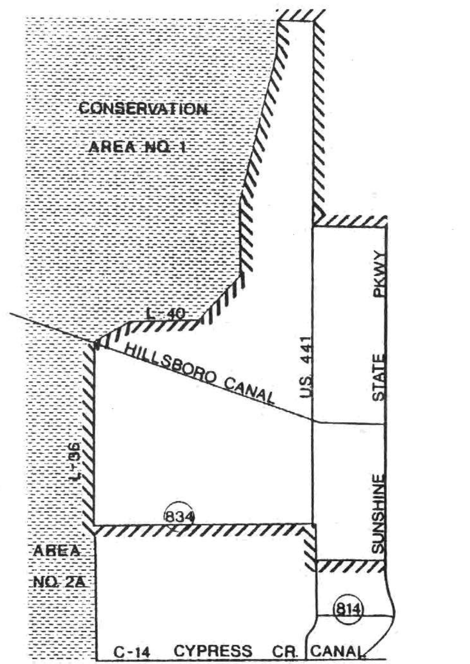



Figure 2

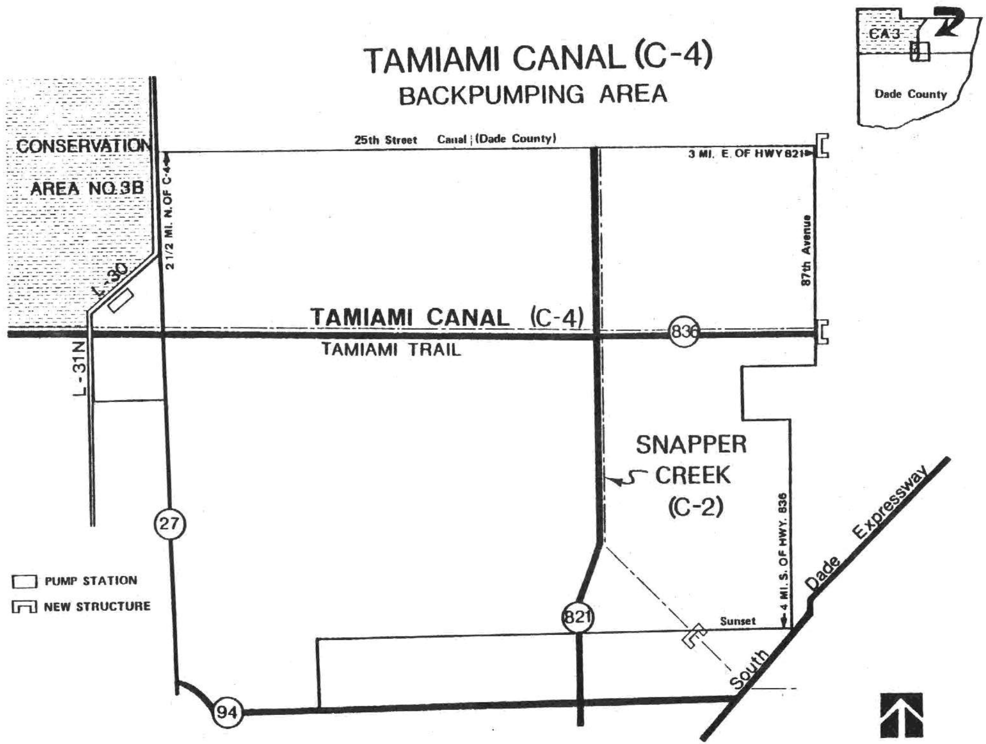

TAMIAMI CANAL (C-4)
BACKPUMPING AREA
CA3
Dade County
CONSERVATION
AREA NO.3B
L-30
L-31N
25th Street Canal (Dade County)
2 1/2 MI. N. OF C-4
3 MI. E. OF HWY 821
87th Avenue
TAMIAMI CANAL (C-4)
TAMIAMI TRAIL
836
SNAPPER
CREEK
(C-2)
27
821
94
Sunset
4 MI. S. OF HWY. 836
South Dade Expressway
PUMP STATION
NEW STRUCTURE

Figure 3

and 3. The east basins would still discharge to tidewaters, while the west basins would be totally or partially backpumped to the Conservation Areas (see Figure 4).

## 2. DESCRIPTION OF THE CLAD MODEL

Basically, the CLAD model (CLAD stands for concentrations, loadings and discharge) has the following three major components:

1. The Discharge model
2. The STORM model
3. Quality calculations

These components are discussed below:

### 2.1 THE DISCHARGE MODEL

Using a water balance approach on a monthly basis, the discharge model estimates future discharges from the following equations:

$$\text{Inflow} - \text{Outflow} = \text{Storage Change} \quad (1)$$

Using various inflow, outflow and storage entities, equation (1) is rewritten as shown below:

Rainfall (R) - Discharge (DIS) - Surface Water Evapotranspiration (SWET) - groundwater evapotranspiration = groundwater outward seepage - groundwater inward seepage + depression storage evapotranspiration (DSET) + groundwater storage change (includes surface water storage change)

Surface water storage was considered an extension of the groundwater system. The basins modeled have controlled surface water (canal) elevations.

Combining groundwater terms together, we define:

net groundwater loss (NGWL) = groundwater outward seepage - groundwater inward seepage + groundwater storage change + groundwater evapotranspiration (3)

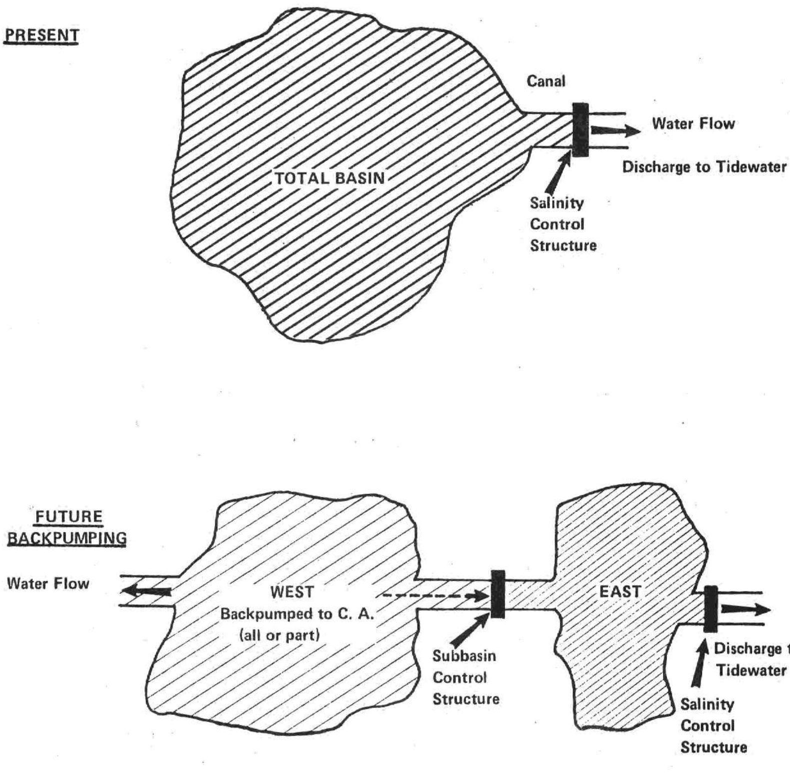



FIGURE 4

SCHEMATICS OF THE BACKPUMPING ALTERNATIVE

This simplification provides us with the following water balance equation

$$R \doteq DIS + DSET + SWET + NGWL \tag{4}$$

where

R = Rainfall data largely obtained from United States Weather Bureau data,

DIS = Surface water discharge of the basin obtained from United States Geological Survey water supply papers,

SWET = Evapotranspiration from surface water which is determined by multiplying monthly potential evaporation rates by the evaporation coefficient and area of open surface water.

NGWL = Net groundwater loss which is estimated

DSET = Evapotranspiration from depression storage. This is calculated using the following equation:

$$DSET = R - (Runoff)/(C) \tag{5}$$

where

R = hourly rainfall

Runoff = hourly runoff computed by STORM model

C = Area weighted runoff coefficient. (This coefficient can be computed as weighted average of various land uses).

Using present combinations of land use related input data and observed sets of rainfall (R) and discharges (DIS), net groundwater losses for a historical case are estimated by

$$NGWLH \doteq R - DISH - DSETH - SWETH \tag{6}$$

where

NGWLH = Net groundwater loss for historical case

R = Rainfall (as before)

DISH = Historical discharge

DSETH = Evapotranspiration from depression storage for historical case,

SWETH = Evapotranspiration from surface water for historical case.

It is to be noted that Equation 6 is a rearrangement of Equation 4 and H is added to the end of every term to represent the historical case.

The discharge model estimates future discharges in the following steps (Please note that F is added to the end of every term of the mass balance Equation 4 to represent future condition).

(1) Use the same rainfall record as was used for the historical case

(2) Assuming that future groundwater losses decrease as the impervious cover increases, future net groundwater losses (NGWLF) are estimated by

$$NGWLF = NGWLH/(I+IFI) \quad \text{if } NGWLH > 0$$

and

$$NGWLF = (NGWLH)(1+IFI) \quad \text{if } NGWLH < 0 \qquad (7)$$

where

$$IFI \doteq \text{Increase in impervious fraction}$$

$$= \sum_{i=1}^{N} [(IF_i)(Area_i)/\text{Total Area}]_{\text{future condition}}$$

$$- \sum_{i=1}^{N} [(IF_i)(Area_i)/\text{Total Area}]_{\text{historical condition}} \qquad (8)$$

and $IF_i$ = Impervious Fraction for land use i

(3) Estimate Evapotranspiration from depression storage for future conditions (DSETF) using Equation 5.

(4) Evapotranspiration from surface water (SWETF) is a model input

(5) Compute future discharges (DISF) by plugging all the known terms of the righthand side of the following equation:

$$DISF = R - DSETF - SEWTF - NGWLF \quad (9)$$

(6) The nonpoint discharge (ONPSQN) is finally estimated as

$$ONPSQN = DISF - Surface\ runoff \quad (10)$$

The discharge model is summarized in Figure 5.

Surface runoff is computed by the STORM model which is briefly described in the following section.

## 2.2 STORM MODEL

The STORM (storage, treatment, overflow and runoff) model is a mathematical model developed by the United States Army Corps of Engineers for estimating quantity and quality of surface runoff. There are several versions of STORM. In this report, the January 1975 version is used. STORM has the following two computational steps which are subsequently used by the CLAD model.

A. Surface runoff quantities: The runoff contributions from urban and nonurban areas are computed by the following equation:

$$R_s = C_u(P - ADS_u) + C_n(P - ADS_n) \quad (11)$$

where

$R_s$ = surface runoff (to be estimated)

$C_u$ = urban runoff coefficient

This coefficient is estimated by taking the weighted average of pervious and impervious runoff coefficients for each of the five land uses (single family, multiple family, commercial, industrial and open space) with their respective percentages of urban area and imperviousness.

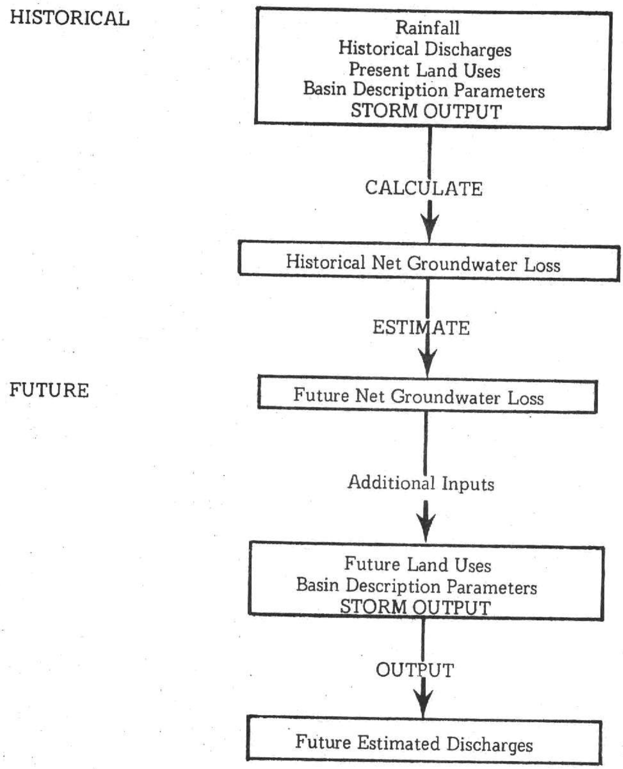



FIGURE 5

A Flowchart of the Discharge Model

$P$ = Hourly rainfall

$ADS_u$ = Available urban depression storage. This is a function of depression storage and evaporation rate which are input parameters.

$ADS_n$ = Available nonurban depression storage

B. <u>Storage Runoff Quality:</u> The pollutant runoff form of the equation is

$$\text{Washoff} = P_o(1 - e^{-KR_s}) \quad (12)$$

where

Washoff = Pollutant washed off by the rainfall in pounds,

$P_o$ = Initial pounds of pollutant on the basin

$K$ = Washoff coefficient (an input value)

$R_s$ = Surface runoff (computed from Step 1)

The five pollutants considered in the January 1975 version of STORM for both urban and nonurban land uses are suspended solids, settleable solids, biochemical oxygen demand (BOD), nitrogen and phosphorus. The solids and nonurban loadings are independently calculated, however, the urban BOD, N and P washoffs are dependent on urban solids washoffs. This dependence can be annuled by inputting very small accumulation rates for urban solids (not zero since STORM has default values)

Street sweeping and its efficiency in reducing the amount of pollutants accumulated is an additional option available in these surface runoff quality computations.

## 2.3 QUALITY COMPUTATIONS

The following steps are involved in the water quality analysis.

1) Using at least one year of monthly water quality data coupled with monthly discharge data, monthly nonpoint loadings from the basin are computed. Any point source contributions during the data collection period must be deducted.

The term "data collection period" is also referred to as "data base period" in this report. The nonpoint loadings computed in this step are also known as historical loadings which include surface runoff loadings and loadings from other nonpoint sources and sinks. These calculations are done before CLAD model is run.

2) Estimate the surface runoff loading by using STORM for the data base period. To do this, first run STORM and STORM SUM (a program in CLAD model to sum up surface runoff on monthly basis), and second calibrate STORM output to the data above by trends (loadings and/or concentrations versus time) and the maximum limits (discharge loadings).

3) Knowing the total historical loadings and quantities from Step 1 and calculating the surface runoff loadings and quantities from Step 2, the quantities and loadings of other nonpoint sources are obtained by subtraction. Other nonpoint sources and sinks concentrations can then be calculated. An iterative procedure is employed by the user to find the best data fit with output from Steps 1 and 2.

4) Using the computed other nonpoint source concentrations and projected land uses, the CLAD model provides quantity and quality (loading and concentrations) for future scenarios.

The parameters most effective in quality calibrations are the exponents for dust and dirt washoffs and the pollutant accumulation rates. Runoff coefficients and depression storage also affect quality outputs, but they affect quantity much more.

The CLAD model is also designed to reduce future urban loadings by expected pollutant removal efficiencies. These removal efficiencies are model inputs for the entire urban area. They were calculated for grassed swale drainage and detention basins as follows:

$$REFF = [(EFFGS)(FRACGS) + [1-(EFFGS)(FRACGS)](EFFDB)(FRACDB)](NDUA/TFUA) \quad (13)$$

where

REFF = Removal efficiency for future urban areas

EFFGS = Removal efficiency for grassed swales,

FRACGS = Fraction of area in newly developed urban areas to have grass swales,

EFFDB = Removal efficiency of detention basins,

FRACDB = Fraction of area in newly developed urban areas to have detention basins,

NDUA = Newly developed urban area,

TFUA = Total future urban area.

## 2.4 CLAD MODEL OUTPUT

The CLAD model with its preceeding three components produces the following output which has 11 output sections:

(1) List of input, an echo print excluding rainfall.

(2-4) STORM quality output for three land uses: present, future, and future urban. These outputs are identical to the STORM quality printout. They give, for each event (an event occurs when there is sufficient rainfall to cause surface runoff), rainfall, runoff, and pollutant washoffs in pounds.

(5-7) STORM SUM, monthly runoff quality summary from STORM plus depression storage evapotranspiration for the three land uses.

(8) Surface runoff concentrations for the three land uses.

(9) Other nonpoint sources and sinks quantities and loadings.

(10) Quantity output; listing monthly rainfalls and for present and future land uses: basin discharges, runoffs, depression storage evapotranspirations, surface water evapotranspirations, and net groundwater losses.

(11) Future basin discharged quality: monthly loadings and concentrations.

## 2.5 LIMITATIONS OF THE MODEL

The water balance is a gross estimation of how historical discharges change with future land uses. The CLAD model cannot be considered accurate for short term events (less than monthly for either quantity or quality). Therefore, neither flood analyses nor peak pollutant concentrations or loadings can be obtained through the use of the CLAD model. Appropriate use of the model is for long term or accumulative water quantity and quality effects on basin discharges for projected land uses. Such applications are, for example, regional water supply routings, seasonal storage analyses, and gross quantity and loading evaluations on downstream receiving waters.

There is a general lack of definition and knowledge concerning other nonpoint groundwater sources and sinks, and their variations. These monthly concentrations have been assumed constant from year to year. During high rainfall other nonpoint source concentrations would probably be lower. For low rainfall years, other nonpoint source concentrations would probably be higher, but the sinks may balance out the discharged loadings.

Future discharge predictions were made by assuming the net groundwater losses in a basin would decrease in proportion to the increase in impervious ground cover. This was assumed for simplicity, and because of the general lack of knowledge and complexities in predicting future groundwater mass balances. The assumption is most valid for small increases in impervious areas, non zero net groundwater losses, and when the net groundwater losses are dominated by groundwater evapotranspiration.

Increases in water demand must be considered separately. These discharge predictions don't include increased demands, or their effects on the groundwater system.

Quality predictions presently lack well defined, area sensitive, land use pollutant accumulation rates. However, they are initiated with Florida data (Nonpoint Source Effects, Wanielista), and then they are calibrated by limits and trends, as previously explained.

Presently this model doesn't include any mixing calculations. That is the water quality of surface runoff plus that of other nonpoint sources and sinks is equivalent to the discharged water quality, they are not mixed with the water stored in the conveyances. This causes little or no problems during the wet season, but it can cause high pollutant concentration predictions during the dry season. When surface runoff exceeds discharge, the pollutant loadings into into the canal will probably exceed the discharged loadings. In these cases the discharged quality is set equal to the surface runoff quality. In reality, during these periods the surface runoff is diluted by stored surface water, and some uptakes are likely. Mixing effects should be added to this model to adjust the high pollutant concentration predictions during the dry season, and to add temporal cohesion to the model.

The model is applied to canal drained basins. Canals are deep, narrow water conveyances, with little or no littoral areas. Canals are not conducive to biological activity. It is therefore easier to model canal discharged loadings because of their deficiency in natural pollutant sinks. For a natural watercourse, uptakes will become much more significant. This may require additional calibrations or program modifications in terms of ET changes, demand supplied, quality and mixing processes.

## 3. INPUT REQUIREMENTS

### 3.1 INPUT DATA

There are the following types of input data pertaining to (A) discharges (B) quality related concentrations (C) rainfall and (D) input information to STORM

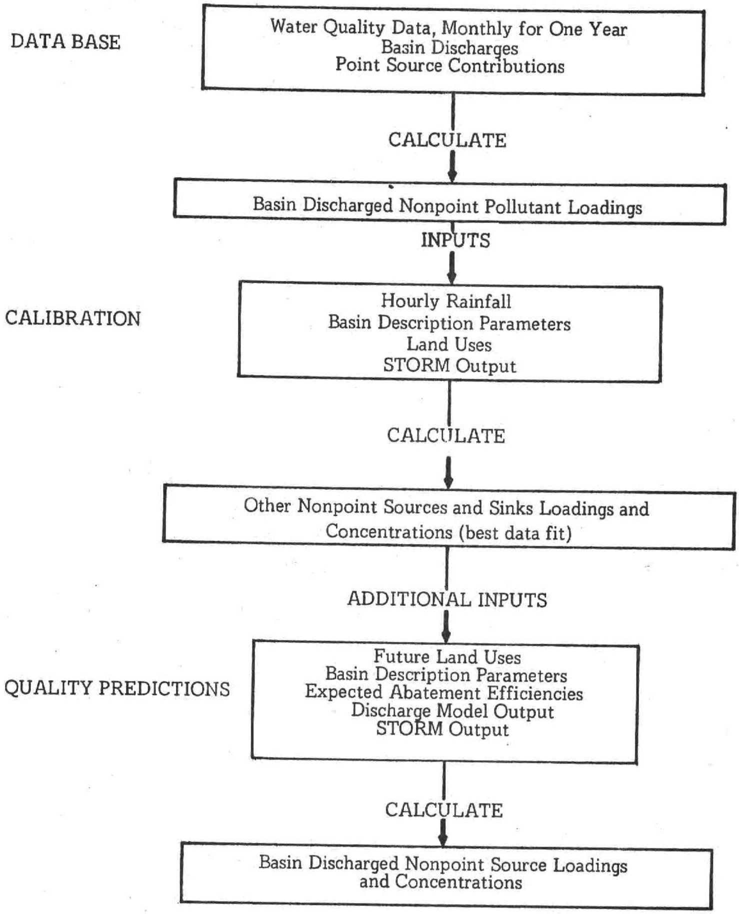



FIGURE 6

VARIOUS STEPS OF THE QUALITY CALCULATIONS for present, future and future urban land uses.

(A) Input Set Related to Discharges:

| Variable | NO. Cards | Card | Card Columns | Descriptions |
|---|---|---|---|---|
| SWETH | 2 | 1 | 1-7 | Basin identification, must be identical to all other Basin ID's |
| | | | 11-20,..., 71-80 (fields of ten) | Surface water ET for Jan. thru July, in Ac. Ft. assumed repetitive each year. |
| | | 2 | 1-7 | Basin ID |
| | | | 11-20,..., 51-60 | Surface water ET for Aug. through Dec. |
| | | | 71-75 | Card ID "SWETH" |
| SWETF | 2 | Both | | Same as SWETH for future |
| IFI | 1 | 1 | 3-6 | Increased fraction impervious, (see Equation No. (8)) |
| | | | 71-3 | Card ID "IFI" |
| DISH | 2 per yr. | 1 | 1-7 | Basin ID |
| | | | 9-10 | Year |
| | | | 11-20,..., 71-80 | Historical basin discharges for Jan. through July, Ac-Ft. |
| | | 2 | 1-7 | Basin ID |
| | | | 9-10 | Year |
| | | | 11-20,..., 51-60 | Historical basin discharges for Aug. through Dec. |
| | | | 71-4 | Card ID "DISH" |

(B) Quality Inputs:

| Variable | NO. Cards | Card | Card Columns | Descriptions |
|---|---|---|---|---|
| (2) Quality ONPSCSS | 2 | 1 | 1-7 | Basin ID |
| | | | 11-20,..., 71-80 | Other nonpoint sources and sinks suspended solids concentrations for Jan. through July, mg/l |
| | | 2 | 1-7 | Basin ID |
| | | | 11-20,..., | as above for August through December |
| | | | 71-77 | Card ID "ONPSCSS" |
| ONPSCBOD | 2 | | | Same as above but for BOD |
| ONPSCTN | 2 | | | " " " " " Total Nitrogen |
| ONPSCTP | 2 | | | " " " " " Total Phosphorus |
| REFF | 1 | 1 | 1-7 | Basin ID |
| | | | 11-20,..., | Future abatement efficiencies for total urban area. See equation (13), in order: SS, BOD, TN, TP: Input Fraction (0.50 not 50%) |
| | | | 71-4 | Card ID "REFF" |

(C) Rainfall: The format is the same as STORM with the exception that the C2 card is omitted. Card or tape files may be used.

(D) Input to STORM: The format of input sets to STORM is given in details in reference No. 12. The CLAD model has restricted certain fields which are given below:

1) Omit rainfall data which is already included in section (C) above
2) On B1 card, field 1 must be 1 because CLADM is presently limited to one watershed per analysis.
3) On B1 card, field 2 must be 0 if a rainfall tape is used. The file reserved for snowmelt computations (Tape 11) is used for rainfall tape inputs. If both snowmelt computations and a rainfall tape are desired, another tape I/O unit must be reserved.
4) On C1 card, field 9 must be 1.
5) C2 card is omitted.
6) On E1 card, field 0, basin identification. This must be the same in columns 4-10 as in columns 1-7 of discharge and quality inputs. This is a check for data continuity.
7) Land uses must be put in order: present, future, and future urban. Future urban land use is identical to future, but input 0.0 on H1 card, field I.

The calibration run is made with three land uses: present, present, and present urban. The abatement removal efficiencies and increased fraction impervious are set equal to zero.

## 3.2 INPUT DERIVATIONS

### A. Pollutant Accumulation Rates for Surface Runoff

The land use loading rates (pollutant accumulations on land surfaces in lbs/acre/day) used in the backpumping studies are values published by Wanielista, et al, of Florida Technological University (FTU) modified to reflect five urban land uses. These loadings were used in STORM to estimate pollutant (SS, $BOD_5$, Total N, and Total P) loadings into primary drainage canals. The FTU loadings are published for both urban and nonurban land uses. The nonurban land uses are divided into cultivated, pasture, and woodland. The urban loadings were not subdivided by land uses as depicted in Table 1.

To more closely reflect urban land use loadings, the average urban loadings were subdivided into the following land uses: (1) single family, (2) multiple family, (3) commercial, (4) industrial, and (5) open space as shown in Table 2. Values in Table 2 are computed by weighing the land use loadings according to

TABLE 1

FTU Land Use Loading Rates*
(lbs/acre/day)

| | $BOD_5$ | Total Nitrogen | Total Phosphorus | Suspended Solids |
|---|---|---|---|---|
| Urban-Range** | 0.130-0.200 | 0.00782-0.0440 | 0.00244-0.0122 | 1.780-11.720 |
| Average | 0.183 | 0.0208 | 0.00489 | 4.156 |
| Pasture-Range | 0.0147-0.0416 | 0.00611-0.0208 | 0.000587-0.00161 | only one value |
| Average | 0.0269 | 0.0130 | 0.000733 | 2.054 |
| Cultivated-Range | 0.00978-0.0758 | 0.0367-0.0905 | 0.000440-0.00396 | only one value |
| Average | 0.0440 | 0.0636 | 0.00257 | 10.268 |
| Woodland-Range | 0.00978-0.0171 | 0.00587-0.0125 | 0.0000244-0.00210 | 0.110-0.323 |
| Average | 0.0122 | 0.00758 | 0.000244 | 0.240 |

* References used were: Burton (1975), Angino (1972), Weibel (1964), Weibel (1966), Weibel (1969), Weidner (1969), Colston (1974), Shannon (1972), Kluesener (1974), EPA (1973), Harriss (1974), Sherwood (1975), and Lamonds (1974).

** Range is the limits of average loadings over a complete discharge hydrograph.

TABLE 2

Urban Land Use Loading Rates*
(lbs/acre/day)

| | $BOD_5$ | Total Nitrogen | Total Phosphorus | Suspended Solids |
|---|---|---|---|---|
| Single Family - Range** | 0.0317-0.0487 | 0.00211-0.0119 | 0.000584-0.00292 | 0.424-2.795 |
| Average | 0.0446 | 0.00562 | 0.00117 | 0.991 |
| Multiple Family - Range | 0.0753-0.116 | 0.00880-0.0495 | 0.00191-0.00956 | 1.005-6.619 |
| Average | 0.106 | 0.0234 | 0.00383 | 2.347 |
| Commercial-Range | 0.318-0.490 | 0.0117-0.0660 | 0.00534-0.0267 | 4.240-27.915 |
| Average | 0.448 | 0.0312 | 0.0107 | 9.899 |
| Industrial-Range | 0.125-0.192 | 0.0186-0.105 | 0.00343-0.0172 | 2.526-16.632 |
| Average | 0.176 | 0.0495 | 0.00689 | 5.898 |
| Open Space - Range | 0.00978-0.0171 | 0.00587-0.0125 | 0.0000244-0.00210 | 0.110-0.323 |
| Average | 0.0122 | 0.00758 | 0.000244 | 0.240 |

* Calculated as explained in text
** Calculated from ranges in table 1

the ratios of the loadings as recommended in STORM and by area weighting with average land uses. The open space loadings were equated to woodland loadings. To understand this conversion, an example is discussed below:

First, the pollutant accumulation rates in STORM were converted to lbs/acre/day. This was done by using STORM's default values and assuming curb lengths per acre for each land use as given in Table 3. Next, these values are multipled together to obtain the desired results as shown in Table 4. For example, commercial nitrogen loading in lbs/acre/day = (3.3/100)*(0.041/100)*83 = 0.001123. The third step is to assume an urban land use distribution. Open space loadings were assumed equivalent to woodland, and the assumed other land uses were 33.75 percent for single family, 33.75 percent for multiple family 27.8 percent for commercial, and 4.7 percent for industrial in Florida. Finally, the one urban accumulation rate in Table 1 was subdivided into the other land uses by the fraction of the land uses contribution to the total urban contributions:

$$\text{Accumulation rate} = \left(\frac{\text{Accumulation rate for land use i}}{\Sigma \text{ Urban Accumulation}}\right)_{\text{STORM}} *(\text{Accumulation of FTU})$$

where $\Sigma$(Urban Accumulation Rate of STORM) = $\Sigma$(Accumulation i * Fraction of land use i). For example, suspended solids accumulation rate for single family in STORM is 0.0466 from Table 4, the FTU urban accumulation rate is 4.156 from Table 1 and

$$\begin{aligned}\Sigma(\text{Urban Accumulation})_{\text{STORM}} &= 0.0466*0.3375+0.1104*0.03375 \\ &+ 0.04656*0.2780+0.2774*0.047 \\ &= 0.19547\end{aligned}$$

and

$$\begin{aligned}\text{Accumulation for S.S.} &= \left(\frac{0.0466}{0.19547}\right) * 4.156 \\ &= 0.991 \text{ lbs/acre/day}\end{aligned}$$

Suspended solids accumulation rates for multiple family, commercial and

TABLE 3

Conversion of STORM loadings into lbs/acre/day

| Land Use | Dust and Dirt* Accumulation (lbs/day/100 ft. gutter) | Pounds of Pollutant/100 lbs. of Dust and Dirt | | | | Curb length** |
|---|---|---|---|---|---|---|
| | | SS | BOD | N | $PO_4$ | (ft/acre) |
| Single Family | 0.7 | 11.1 | 0.50 | 0.048 | 0.005 | 60.0 |
| Multiple Family | 2.3 | 8.0 | 0.36 | 0.061 | 0.005 | 60.0 |
| Commercial | 3.3 | 17.0 | 0.77 | 0.041 | 0.007 | 83.0 |
| Industrial | 4.6 | 6.7 | 0.30 | 0.043 | 0.003 | 90.0 |
| Open or Park | 1.5 | 11.1 | 0.50 | 0.048 | 0.005 | 30.0 |

* STORM default values

** Assumed average values

TABLE 4

STORM Pollutant Accumulation Rates*
(lbs/acre/day)

| Land Use | SS | BOD | N | $PO_4$ |
|---|---|---|---|---|
| Single Family | 0.0466 | 0.00210 | 0.000202 | 0.000004 |
| Multiple Family | 0.1104 | 0.00497 | 0.000842 | 0.000021 |
| Commercial | 0.4656 | 0.02109 | 0.001123 | 0.000012 |
| Industrial | 0.2774 | 0.00828 | 0.001780 | 0.000005 |
| Open or Park | 0.0500 | 0.00225 | 0.000216 | 0.000009 |

* FOR CALCULATION PURPOSES ONLY, NOT INTENDED AS MODEL INPUTS. Note these BOD, N and $PO_4$ loadings are dependent on solids loadings.

industrial land uses are 2.347, 9.899, and 5.898 respectively (see Table 2).

The Crops of Engineers has recommended loading rates in the July 1976 STORM users manual, these values are compiled in Table 5.

B. Removal Efficiencies in Surface Runoff

A limited, in-house, literature search was done to investigate pollutant removal efficiencies in detention basins, grass swales, and through soil filtration. This brief search was done in conjunction with the proposed backpumping alternatives considered in the CLAD model to simulate required pollution abatement measures on future developments.

Removal efficiencies applicable to stormwater runoff detention ponds are shown in Table 6. The requirement to retain the first one inch of runoff will allow sufficient time for biological stabilization. A 40% removal efficiency for both nitrogen and phosphorus is selected from the data. From Weibel, et al., nitrogen removals may be even greater.

The efficiencies of grass and grass-soil filters for the water quality treatment of urban runoff was examined by Popkin. The treatment system consisted of a grass-covered filter of native calcarious loam. Both warm and cool season conditions were studied. The following are maximum measured treatment efficiencies in percent, for the grass and grass-soil filters respectively: chemical oxygen demand: 19 and 88; suspended solids; 34 and 99.6; volatile suspended solids; 26 and 97; turbidity: 97 and 98; total coliforms: 84 and 98; fecal coliforms: 50 and 98. Grass maturity and soil compaction improve pollutant removals. Popkin also reviewed literature on grass and soil filtration. Hydraulic loadings or loading capacities and average infiltration rates are established. From this study the author concludes that chlorination of the filtration treated runoff is necessary.

Table 5

Pollutant Accumulation Rates from
July 1976 STORM
(lbs/acre/day)

| Land Use | SUS | SET | BOD | NIT* | $PO_4$ | COLI** |
|---|---|---|---|---|---|---|
| Low Density Res. 2-5 DU/AC | .12 | .09 | .04 | .007 | .0042 | 1.200 |
| Med. Density Res. 5-10 DU/AC | .45 | .18 | .07 | .028 | .0063 | 1.260 |
| High Density Res. >10 DU/AC | 3.16 | 1.00 | .13 | .025 | .0200 | 9.800 |
| Commercial | | | .46 | .212 | .0400 | 9.000 |
| Industrial | | | .39 | .209 | .0300 | 10.000 |
| Open Space and Rural | Average values not available. Consult local water quality specialists. | | .02 | .007 | .0020 | 1.000 |
| Pastures | | | 3.10 | .392 | .3500 | 120.000 |
| Farming | | | .02 | .044 | .0002 | .500 |
| Forests (Douglas Fir) | | | .01 | .002 | .000024 | .001 |

* organic nitrogen + $NH_3$ + $NO_3$

** $10^9$ MPN/acre/day

Note: These coefficients may not be representative of a given study area and should be adjusted based on site-specific data.

Table 6

Detention Removal Efficiencies (Percent)

| | COD | $BOD_5$ | SS | VSS | Tot-N | $NH_3$ | $NO_2$ | $NO_3$ | TKN | Org-N | Tot-P | Sol-P | Reference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Drain Sedimentation | | 20 | 60 | | 15 | | | | | | 15 | | Johnson |
| Sedimentation & Stablization | | 95 | 95 | | 40 | | | | | | 40 | | |
| Detention Storage | | 20 | | | | | | | | | | | Burke |
| Detention time | | | | | | | | | | | | | |
| 1 hr. | | 20 | 40 | | | | | | | 35 | 10 | | |
| 2 hrs. | | 25 | 60 | | | | | | | 40 | 20 | | |
| 3 hrs. | | 25 | 65 | | | | | | | 40 | 25 | | |
| 4 hrs. | | 30 | 70 | | | | | | | 40 | 30 | | |
| 5 hrs. | | 30 | 70 | | | | | | | 40 | 30 | | |
| Settling Characteristics | | | | | | | | | | | | | Weibel, et. al. |
| Settling time | | | | | | | | | | | | | |
| 10 min. | 13 | 40 | 39 | 34 | 9 | 0 | 0 | 0 | | 14 | 4 | 0 | |
| 20 min. | 13 | 44 | 46 | 45 | 14 | 0 | 0 | 0 | | 21 | 13 | 0 | |
| 1 hr. | 18 | 20 | 57 | 50 | 28 | 0 | 0 | 0 | | 43 | 13 | 0 | |
| 4 hrs. | 34 | 20 | 71 | 60 | 56 | 0 | 0 | 0 | | 86 | 34 | 0 | |
| 24 hrs. | 47 | 48 | 87 | 84 | 56 | 0 | 0 | 0 | | 86 | 39 | 0 | |
| Sedimentation | | | | | | | | | | | | | Morris, et. al. |
| Detention time | | | | | | | | | | | | | |
| 15 min. | 16,61 | 17 | 37,77 | | | | | | 15 | | 7 | | |
| 20 min. | 13-19 | 13 | 33-38 | 24-37 | | | | | | | | | |
| 30 min. | 10 | 12 | 38 | | | | | | 20 | | 13 | | |
| 1 hr. | 18,30 | 11,20 | 51,57 | | | 0 | 0 | 0 | 20,37 | 43 | 13,15 | | |
| 2 hr. | 33 | | | | | | | | | | | | |
| 4 hrs. | | | | | | | | | | 40 | 30 | | |
| 5 hrs. | 33,35 | 31 | 50,75 | 62 | | | | | | 43 | 35 | | |
| Design Storm = 2 yr. 1 hr. | | 35 | 60 | | 15 | | | | | | 35 | | |
| Sedimentation | | | | | | | | | | | | | Gill, et.al. |
| % in Sediment | | | | | | | | | | | | | |
| Site 1 | | | | | 32 | | | | | 63 | | | |
| Site 2 | | | | | 23 | | | | | 66 | | | |
| Site 3 | | | | | 17 | | | | | 31 | | | |
| Storage Basin | | 91 | | 28 | 62 | | | | | 69 | | | Lager & Smith |

Myers has done a field study on nutrient (nitrate and phosphate) removal using grass filtration. The parameters studied include: application rate, flow distance, application frequency, and season of the year. Nutrient removals were low ranging from 0-20%. Field and lab tests indicated that contact time was the most important variable. Removal efficiencies increased with increasing flow distance, reduced application rates, and reduced application frequencies. With a soil-grass system, lab tests showed a 90% reduction in nitrate. The authors recommend the incorporation of an impervious layer. Other considerations were: ground cover, temperature, and initial concentrations.

The removal efficiencies that are considered in the CLAD model are related to surface runoff only. The reductions in loadings due to infiltration are accounted for in runoff coefficients for the drainage system. The range of nutrient removal efficiency used in the CLAD model for predicting the future loading from developments with abatement measures is 40-52% assuming 40% reduction in detention basins and 0-20% reductions in grass swales.

C. Runoff Coefficients and Depression Storages for STORM

The runoff coefficients used in STORM for Palm Beach and Broward Counties are as follows: 0.90 for urban impervious areas with direct drainage systems connecting these impervious areas to the drainage canals; 0.40 or 0.45 for urban imprevious with grassed swale drainage, 0.20 for urban pervious areas, and 0.23 for nonurban areas. In STORM, only one urban impervious runoff coefficient can be input. This coefficient is an area weighted average. The urban pervious runoff coefficient is lower than the nonurban coefficient because there is a potential for runoff to drain under impervious areas thus reducing its runoff. In Dade County the assumed runoff coefficients are 0.90 for urban direct drainage impervious, 0.40 for urban grassed swale drainage, and 0.10 for both urban pervious and nonurban.

Depression storages are also necessary for runoff calculations in STORM. The assumed depression storages are: 0.10" for urban, 0.30" for forest, 0.20" for pasture, and 0.30" for cultivated. For high intensity (smooth) cultivated areas a value of 0.10" could be used, however, 0.30" was used because of the flat topography of south Florida. There is only one value of nonurban depression storage used in STORM. These values are also area weighted averages according to land uses.

It is to be noted that all of these values are preliminary estimates, and are subject to revision as more site specific data becomes available.

D. Land Use Aggregation

The mathematical model STORM requires land use pollutant accumulation rates as an input to generate the quality of surface runoff. These land uses are divided into a nonurban classification and five urban groups (1) single family, (2) multiple family, (3) commercial, (4) industrial, and (5) open or park. The nonurban classification is divided external to the program into three land use categories: (1) pasture, (2) cultivated, and (3) woodland. The pollutant accumulation rates for these land uses are area weighted averages for the one nonurban land use classification.

The "Land Use Coding System" (South Florida Water Management District) is divided into three levels: I, II, and III, each with increasing land use clarification. The interface of this system with the STORM model is given in Table 7. The basin model inputs and outputs are listed in figure 7.

# 4. APPLICATIONS

## 4.1 Western West Palm Beach Canal (C-51) Plus L-8

Water quantity and quality predictions are made for the West Palm Beach Canal basin with backpumping. This backpumping alternative includes both

TABLE 7

Aggregation of SFWMD's Land Use Coding System into STORM Land Uses

| Level I | Level II | Level III | STORM | |
|---|---|---|---|---|
| Urban & Built Up Land | Residential | Single Family<br>Low density<br>Medium density<br>Mobile home | Single Family | |
| | | Sing.Fam-High density<br>Multiple Family | Multiple Family | |
| | Commercial & Services<br>Open & Other | *<br>Golf Course | Commercial | |
| | Industrial<br>Institutional<br>Transportation | *<br>*<br>* | Industrial | |
| | Open & Other (less golf course and underdevelopment) | * | Open Space | |
| Wetlands<br>Barren Land<br>Forest Land<br>Rangeland<br>Water | *<br>*<br>*<br>*<br>* | *<br><br>* | Woodland** | |
| Agriculture | Cropland<br>Orchards etc.<br>Confined Feeding Operations | *<br>* | Cultivated** | Non-Urban |
| | Pasture | * | Pasture** | |

* Expanded Classification Omitted, for further breakdown the reader is referred to the South Florida Water Management District's Land Use Coding System.

** Subgroup, area weighted for nonurban land use

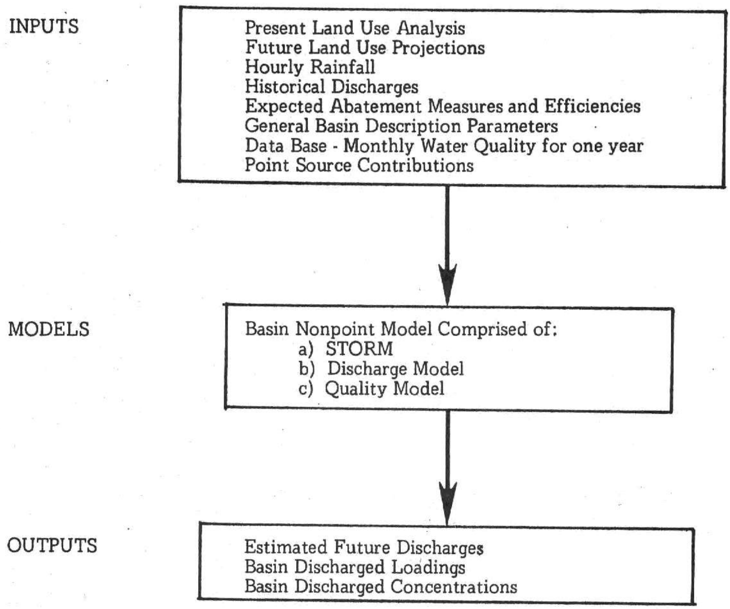



FIGURE 7

THE MODEL INPUTS AND OUTPUTS

the west C-51 and L-8 basins. The west C-51 analysis makes use of the CLAD model. The requirement to subtract M-Canal demands from L-8 discharges necessitated a separate analysis for this basin. The results for both basins, for two land uses (1973-74 and plan scenario), are included. Model inputs and assumptions are discussed below:

4.1.1 Discussion

This discussion is divided into three sections:
1) The west C-51 basin analysis, 2) the L-8 basin analysis and 3) the total backpumped basin.

(1) West C-51 basin

In conjunction with the backpumping studies, the west C-51 basin (Figure 1) discharges and nutrient water quality are estimated for two-land uses: 1973-74 and plan scenario. The basin discharge CLAD model is used.

Land uses have been aggregated or expanded for use in the model as shown in Table 8. Future land use projections did not subdivide agricultural usage into pasture and cultivated. This was done after consultation with the Land Resources's staff, by assuming only 60% of the present pasture lands would remain pastures, the remainder is assumed to be cultivated. In Table 8, the obvious omissions of future multiple family, commercial, and industrial land uses are a result of the land use projection source: (i.e., in the Palm Beach County Master Land Use Plan, the scale was too large to include such land uses). Table 8 also gives the area weighted impervious percentages used in the model.

Pollutant accumulation rates (lbs/acre/day) and depression storages (interception plus surface ponding) are correlated to land uses. Depression storages, as in the WPCF Manual of Practice No. 9, are assumed to be 0.1" for urban areas and for nonurban areas: 0.3" for forest, 0.2" for pasture, 0.1" for high intensity (smooth) cultivated, and 0.3" for low intensity cultivated. The area weighted nonurban depression storages were calculated to be 0.294" and 0.162"

Table 8. West C-51 Land Uses

| | 1973-4 LAND COVER | | PLAN SCENARIO | |
|---|---|---|---|---|
| | Area (Acres) | Percent Imperviousness (Area Weighted) | Area (Acres) | Percent Imperviousness (Area Weighted) |
| URBAN | | | | |
| Single Family | 3747 | 21.4 | 51707 | 20.0 |
| Multiple Family | 28 | 80.0 | | |
| Commercial | 239 | 85.0 | | |
| Industrial | 22 | 61.1 | | |
| Open Or Park | 14338 | 5.0 | 811 | 5.0 |
| Total Urban | 18373 | | 52518 | |
| NONURBAN | | | | |
| Cultivated | 12676 | | 13017 | |
| Pasture | 7833 | | 4700 | |
| Woodland | 35968 | | 4616 | |
| Total Nonurban | 56477 | | 22333 | |
| Total Basin | 74851 | | 74851 | |

for 1973-74 and plan scenario land uses, respectively. The pollutant accumulation rates used for the west C-51 basin are listed in Table 9. The nonurban loading rates have also been area weighted. In the calibration run, if these loading rates did not fit, then they would have been adjusted accordingly. However, no such adjustment is necessary to the west C-51 basin.

As mentioned earlier, the January 1975 version of the Corps of Engineers mathematical model called STORM is incorporated into the CLAD model. In this version of STORM, BOD, N, and P urban washoffs are a function of urban solids loadings. These urban solids loadings were omitted because they would have led to erroneous BOD, N, and P washoffs. However, if zero loadings are input then default values are included in calculations. To avoid this situation very small values, such as 0.000001 for solids dust and dirt accumulation rates are added. Nonurban area loadings don't have this solids dependence, and therefore, are used as model inputs.

This version of STORM was set up for curb and gutter drainage. That is, the pollutant accumulation rates are as a function of the footage of gutters per acre. However, loading rates can be forced into lbs/acre/day by simply inputting pseudo curb lengths and pounds of dust and dirt accumulation rates. For example, in STORM, the inputs are:

$$\left(X \frac{\text{ft. gutters}}{\text{acre}}\right) * \left(Y \frac{\text{lbs.dust and dirt}}{\text{100 ft. gutter/day}}\right) * \left(\frac{\text{lbs. of pollutant}}{\text{100 lbs of dust and dirt}}\right)$$

$$= XY \frac{\text{lbs. of a pollutant}}{\text{10,000 acre/day}}$$

Therefore, by using any combination of X*Y = 10,000, the pollutant accumulation rates in lbs/acre/day can be directly converted to "lbs. of a pollutant/ 100lns. of dust and dirt". Note, because of the low loading rates and limited input fields, the program was set up to use ten times the lbs/acre/day loadings by inputting X*Y value of only 1000. The July 1976 version of STORM has the option to use lbs/acre/day accumulation rates; however, it wasn't available at

Table 9. Pollutant Accumulation Rates (lbs/acre/day) for the West C-51 basin.

| | $BOD_5$ | Total Nitrogen | Total Phosphorus | Suspended Solids |
|---|---|---|---|---|
| URBAN | | | | |
| Single Family | 0.0446 | 0.00562 | 0.00117 | 0.0 |
| Multiple Family | 0.106 | 0.0234 | 0.00383 | 0.0 |
| Commercial | 0.488 | 0.0312 | 0.0107 | 0.0 |
| Industrial | 0.176 | 0.0495 | 0.00689 | 0.0 |
| Open Or Park | 0.0122 | 0.00758 | 0.000244 | 0.0 |
| NONURBAN | | | | |
| Pasture | 0.0269 | 0.0130 | 0.000733 | 2.054 |
| Cultivated | 0.0440 | 0.0636 | 0.00257 | 10.268 |
| Woodland | 0.0122 | 0.00758 | 0.000244 | 0.240 |
| NONURBAN AREA WEIGHTED | | | | |
| 1973-74 Land Uses | 0.0213 | 0.0206 | 0.000825 | 2.705 |
| Plan Scenario | 0.0338 | 0.0414 | 0.001703 | 6.467 |

the time the CLAD Mode was written.

The exponents used for dust and dirt washoffs are 15.0 and 0.46 for urban and nonurban land uses respectively. These are arrived at by calibrating STORM's output for total nitrogen and total phosphorus. The following combinations of urban and nonurban exponents were tried: 15,4.6; 15,0.46; 15,0.05; 4.6,0.46; 4.6,0.05, and 0.46,0.46.

STORM uses a modified rational method to calculate surface runoff:

Surface Runoff = C * (Rain - Available Depression Storage)

The calculation interval is hourly. For this basin, hourly rainfall at the Loxahatchee recording stations, Florida climatological data was used. In cases where data was missing, West Palm Beach airport precipitation was substituted. This data has been stored on tape at FSU in Tallahassee (location RI1098, number 7782, File 1), and is also available on cards.

The runoff coefficients used in this analysis are: 0.2 for urban pervious areas, 0.9 for urban impervious areas, 0.23 for nonurban areas, and 0.45 for urban impervious areas with grassed swale drainage. For the 1973-74 and plan scenario land uses, the area weighted runoff coefficients are calculated as 0.239 and 0.255 respectively. The urban pervious coefficient of 0.2 is lower than the nonurban coefficient because these areas are thought to drain under the impervious areas, thus reducing their runoff. Many variables are considered in selection of these runoff coefficients, including the low ground slopes, soil transmissivities, indirect routing of rooftop drainage over lawns to storm drainage, secondary drainage under impervious areas, and grassed swale drainage.

Three separate approaches were taken to estimate the maximum urban runoff coefficient for the 1973-74 land uses. First, as shown in Table 10, using WPCF's Manual of Practice No. 9 as a reference the runoff coefficient is calculated as 0.291. This coefficient is applicable for storms of 5-10 year frequency. If less frequent and more intense storms are under consideration,

Table 10. "C" of Q=CIA West C-51 1973-4 Land Uses

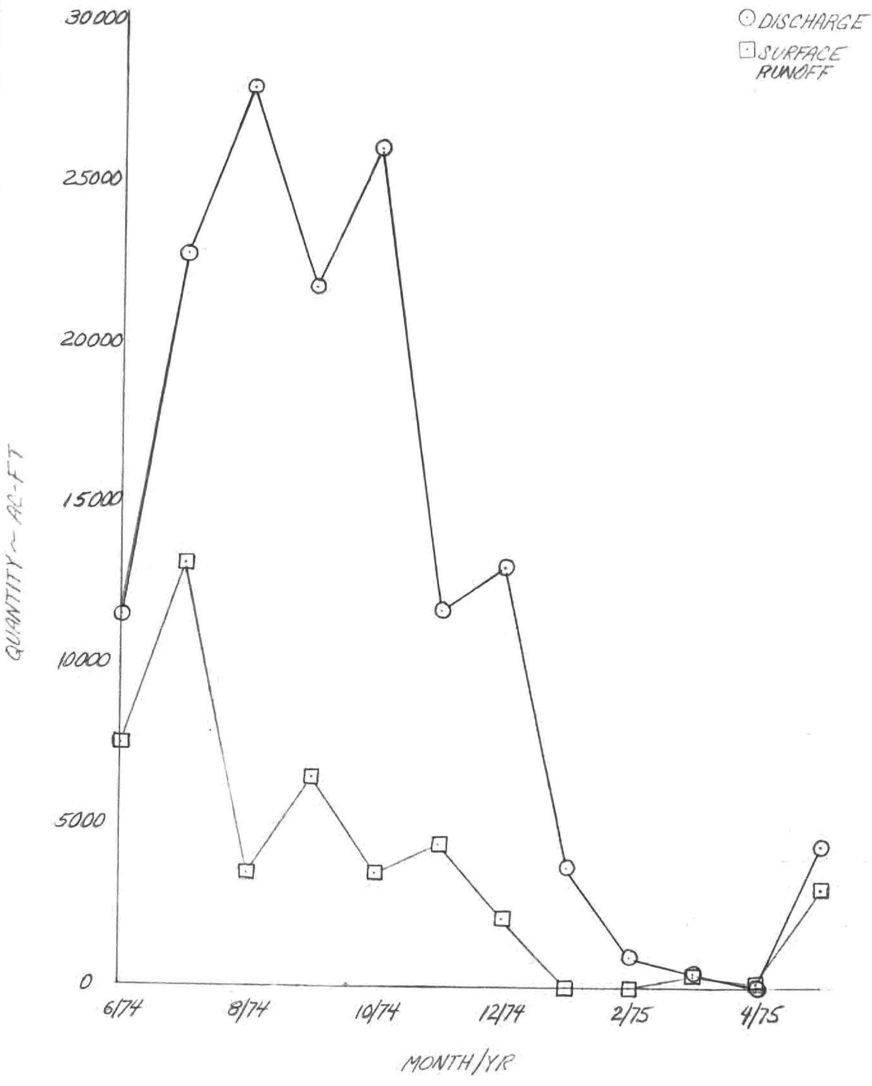
| LAND USE (SFWMD) | EQUIVALENT (WPCF) | AREA (Acres) | RUNOFF COEFFICIENT (Average) | C*AREA |
|---|---|---|---|---|
| Residential | | | | |
| Low density | Residential Suburban | 3591.29 | 0.375 | 1405 |
| Med. density | " " | 155.33 | " | |
| Multiple family | Multi Detached | 28.01 | 0.50 | 14 |
| Commercial | Neighborhood Business | 239.37 | 0.60 | 162 |
| Institutional Gov. | " " | 9.36 | " | |
| Industrial | Light Industrial | 6.35 | 0.65 | 8 |
| Water Supply Plant | " " | 5.94 | " | |
| Open & Other | | | | |
| Golf Course | Park | 154.73 | 0.175 | 3708 |
| Under Development | Avg. Res. Sub. and Unimproved | 14126.72 | 0.2625 | |
| Open & Undeveloped | Unimproved | 56.14 | 0.20 | 15 |
| | | 18373.23 | | 5339 |
| Runoff Coefficient (Area Weighted) | | | | 0.291 |

higher coefficients should be used. Five and ten year storms of 24 hours duration in southeastern Florida are about 3.8 and 9 inches of rainfall, respectively. These are obviously not average events. The 0.291 runoff coefficient should therefore be too high for most rainfall events. This coefficient is used in calculations of peak runoff with the formula Q = CIA. By using the runoff calculation as in STORM, this runoff is reduced by the initial abstractions to depression storage. Secondly, an attempt to use the SCS curve number technique was made. For the hydrologic soil groups of this basin, Cn = 55, and a 10 year, 24 hour storm the equivalent runoff coefficient is 0.388. Finally, runoff hydrographs were graphed by SFWMD's hydrology staff. This resulted in runoff coefficients of about 40%. These calculations are all for major events, and therefore serve only to set a limit on the runoff coefficient as input in STORM.

These runoff coefficients could be studied and defined with more accuracy in the future. However, because these coefficients are applied to such a large basin (74851 acres), when considering the data accuracy (rainfall, discharges, etc.), improvements in defining one variable without improving all variables would probably be unjustified. Also since the CLAD model is based on discharges, and surface runoff is only a portion of that amount, these coefficients become less critical to the overall analysis. The resultant proportionment of surface runoff to discharges for the data base period is illustrated in Figure 8.

When estimating future runoff coefficients for urban areas, ninety percent of future developments were assumed to have grassed swales (GS), the remaining ten percent are assumed to have curb and gutter (CG) drainage. The overall urban impervious runoff coefficient is calculated by area weighting. For the west C-51 basin the newly developed urban area (NDUA) is:

FIGURE 8
WEST C-51 BASIN QUANTITIES FOR THE DATA BASE PERIOD



NDUA = Total future urban area (TFUA)

- open future urban area

- [total present urban area (TPUA) - open present urban area]

= 47672 acres

and the urban impervious coefficient is:

$$\text{CIMP} = \frac{\text{NDUA}}{\text{TFUA}} * (\text{Fraction GS} * \text{CIMP of GS}$$
$$+ (1\text{-fraction GS}) * \text{CIMP of CG})$$
$$+ ((\text{TFUA} - \text{TPUA})/\text{TFUA}) * \text{CIMP of present drainage system}$$
$$= 0.532$$

This analysis assumed that for future nonurban land uses, no abatement measures would be required. Two probable abatement measures have been included as nutrient sinks for future urban developments: (1) grassed swales; 90% of the newly developed urban areas are expected to have this type of drainage, and (2) detention basins; it was assumed that 50% of the newly developed urban areas will be required to have these. The nutrient removal efficiencies used in this analysis are from a limited literature search. These efficiencies are 10% and 40% for both total nitrogen and phosphorus, for grassed swales and detention basins, respectively. These removals for the entire future urban area are calculated to be:

REFF = EFFGS*FRACGS+(1-EFFGS*FRACGS)*EFFDB*FRACDB*NDUA/TFUA

= 0.247 or 24.7%

where

REFF = Removal efficiency for future urban areas

EFFGS = Removal efficiency for grassed swales

FRACGS = Fraction of area in newly developed urban areas to have grassed swales

EFFDB = Removal efficiency of detention basins

FRACDB = Fraction of area in newly developed urban areas to have detention basins

NDUA = Newly developed urban area

TFUA = Total future urban area

This calculation assumes that all areas required to have detention basins will also be required to have grassed swale drainage. It further assumes, for areas with both abatement measures, that after grassed swales remove 10% of the nutrients, 40% of the remaining nutrients (40% of 90%, or 36%) can still be removed in the detention basins. There is obviously a limit to these removals from abatement measures applied in series. A great deal of research in these areas is necessary to establish abatement removal efficiencies.

The uptakes from abatement measures are difficult to define where groundwater components are involved. A total mass balance is necessary to define the system correctly. For example, consider nutrient inflows to a detention basin of 100 lbs via surface runoff at 1.0 mg/l, and 100 lbs. via groundwater flow at 0.5 mg/l. For these, the outflows are 20 lbs. at 0.5 mg/l via overflow, and 50 lbs. at 0.5 mg/l via groundwater. Removal efficiencies of this system could be calculated as: 65% (200 lbs. in, 70 lbs. out), or 80% (100 lbs. in, 20 lbs. out via surface waters). The first calculation is probably the best, while data collection would be much easier for the surface water calculations. There are many unanswered questions in the above, such as: where and how would groundwater measurements be made? What is the sediments role in uptakes and releases? What roles do soils and soil sorption play? and what are the long term removals? In short, abatement removal efficiencies are ill defined and need a lot of future research. This backpumping alternative calls for raising the west C-51 stage from 8.5 to 14.0 ft. The effects of this were investigated by the Groundwater Division of the South Florida Water Management District. Their conclusion was that it should have minimal effects on the water budget. Potential evaporation data was taken from an unpublished manuscript by the RPD of the SFWMD, "Drought Analysis for the Florida Lower East Coast", see Table 11. In STORM, these are used to evaporate water from depression storage during hours of no rainfall. These values are also used to calculate surface water evapotranspirations. For present land uses, they are simply multiplied by the measured surface water area. For future conditions, the surface water is increased by assuming 10% of the lands required to have detention basins (50% of the newly developed urban areas) would be used for water control.

Historical discharges (1963-75) from the west C-51 basin are calculated from available USGS surface water data. This is done by assuming 65% of the C-51 basin generated discharges are from the west subbasin. This 65% is based on the basins area ratio (west C-51/C-51 area = 64.4%) and three hydrologic calculations completed by the hydrology staff which resulted in percentages around 65%. Flows are calculated because flow measurements at the east boundary of the west C-51 basin are not available. The west C-51 generated discharges are calculated from:

$$Q = 0.65 (WPB - S5AE)$$

where,

WPB = flow discharged at the West Palm Beach locks

S5AE = flow discharged at Structure 5A East

Discharges were calculated on a daily basis and are available from January 1961 through June 1975. These discharges are not allowed to be negative, (i.e., if S5AE discharges exceeded WPB discharges, the flow generated in the C-51 basin is assumed to be zero). Additional basin inflows from S5AE probably introduce some discharge calculation errors. For example, this inflow keeps the groundwater artificially high in the dry season. At the beginning of the wet season, higher discharges probably occur because of this.

Table 11. Potential Evaporation Rates

| MONTH | POTENTIAL EVAPORATION (in/month) | (in/day) |
|---|---|---|
| January | 3.23 | 0.104 |
| February | 1.36 | 0.048 |
| March | 2.41 | 0.078 |
| April | 5.08 | 0.169 |
| May | 5.64 | 0.182 |
| June | 6.39 | 0.213 |
| July | 6.71 | 0.216 |
| August | 6.79 | 0.219 |
| September | 6.01 | 0.200 |
| October | 4.83 | 0.156 |
| November | 3.88 | 0.129 |
| December | 2.54 | 0.082 |
| Yearly | 54.87 | |

Future discharge calculations are made from historical discharges, surface runoff calculations, depression storage evapotranspirations, and surface water evapotranspiratinns and are correlated to the increase in impervious cover. This increased fraction of imperviousness is calculated using the following equation:

$$\begin{aligned} \text{IFI} &= \text{increased fraction impervious} \\ &= \Sigma(\text{IF} * \text{Area}_i/\text{Total Area})\ \text{Future} \\ &\quad - \Sigma(\text{IF}_i * \text{Area}_i/\text{Total Area})\ \text{Historical} \\ &= 0.116 \text{ or } 11.6\% \end{aligned}$$

where

$IF_i$ = Impervious fraction for land use i

The quality calculations are based on one year of bimonthly data taken at four locations in the west C-51 basin from 6/74 to 5/75, see Table 12. These sampling sites are located, going from west to east: just east of S5AE, at McArthur Bridge, at Old Wellington Road, and at State Road 7. Monthly nutrient values are obtained by simply averaging all four collection stations. Questions have been raised about what concentrations should be used to represent monthly discharge concentrations. First, simple data calculations for total nitrogen can be different; e.g., if any NO's or TKN's are missing from a sample, one might argue that none of the other values in this sample should be used in the monthly averages. In the approach chosen, all measured values are used. Some other logistical problems also arise from assuming this simple average is representative of discharged monthly concentrations. Alternative approaches are available that address these problems, such as: area weighted average of the measured data, and using the values at SR7 or S5AE. Elaborate statistical and logistical calculations could be made, but because of the measurement frequency and data accuracy, these calculations are not justified.

Table 12. West C-51 Surface Water Quality Data

| Date | TKN (mg/l) | No. TKN Samples | $NO_3$-N (mg/l) | No. $NO_3$ Samples | $NO_2$-N (mg/l) | No. $NO_2$ Samples | Total N $=TKN+NO_x$ (mg/l) | Total P (mg/l) | No. TP Samples |
|---|---|---|---|---|---|---|---|---|---|
| June 74' | 3.48 | 8 | 0.799 | 8 | 0.067 | 8 | 4.35 | 0.065 | 8 |
| July | 1.68 | 8 | 0.229 | 8 | 0.023 | 8 | 1.93 | 0.131 | 8 |
| August | 1.54 | 8 | 0.185 | 9 | 0.052 | 9 | 1.78 | 0.077 | 9 |
| September | 1.27 | 4 | 0.087 | 8 | 0.014 | 8 | 1.37 | 0.068 | 8 |
| October | 1.44 | 12 | 0.194 | 12 | 0.021 | 12 | 1.66 | 0.113 | 12 |
| November | 0.87 | 8 | 0.124 | 8 | 0.004 | 8 | 1.00 | 0.133 | 8 |
| December | 1.45 | 4 | 1.112 | 4 | 0.030 | 4 | 2.59 | 0.108 | 4 |
| January 75' | 0.72 | 8 | 0.103 | 7 | 0.011 | 8 | 0.83 | 0.176 | 8 |
| February | 1.19 | 4 | 0.353 | 4 | 0.011 | 4 | 1.55 | 0.049 | 4 |
| March | 1.36 | 8 | 0.583 | 7 | 0.056 | 8 | 2.00 | 0.113 | 8 |
| April | 1.01 | 8 | 0.254 | 8 | 0.007 | 8 | 1.27 | 0.050 | 8 |
| May | 1.48 | 14 | 0.307 | 14 | 0.046 | 12 | 1.83 | 0.050 | 13 |

Quality calculations are made with a mass balance approach. Yearly discharged nutrients from the CLAD model are equated to the calculated loadings from the data base. Table 13 and Figures 9 and 10 present the resultant model output with the quality data for the calibration period (6/74-5/75). The total discharged pollutants are equated to the sum of those in surface runoff plus those from other nonpoint sources and sinks. These other nonpoint concentrations are set to match yearly and monthly loadings.

Any point sources must be allowed for external to the program. Future point source contributions are assumed to be zero.

At present there is very little knowledge concerning these other nonpoint sources. Two attempts have been made to gain some knowledge concerning these sources. First, a literature search for groundwater nutrient data was done.

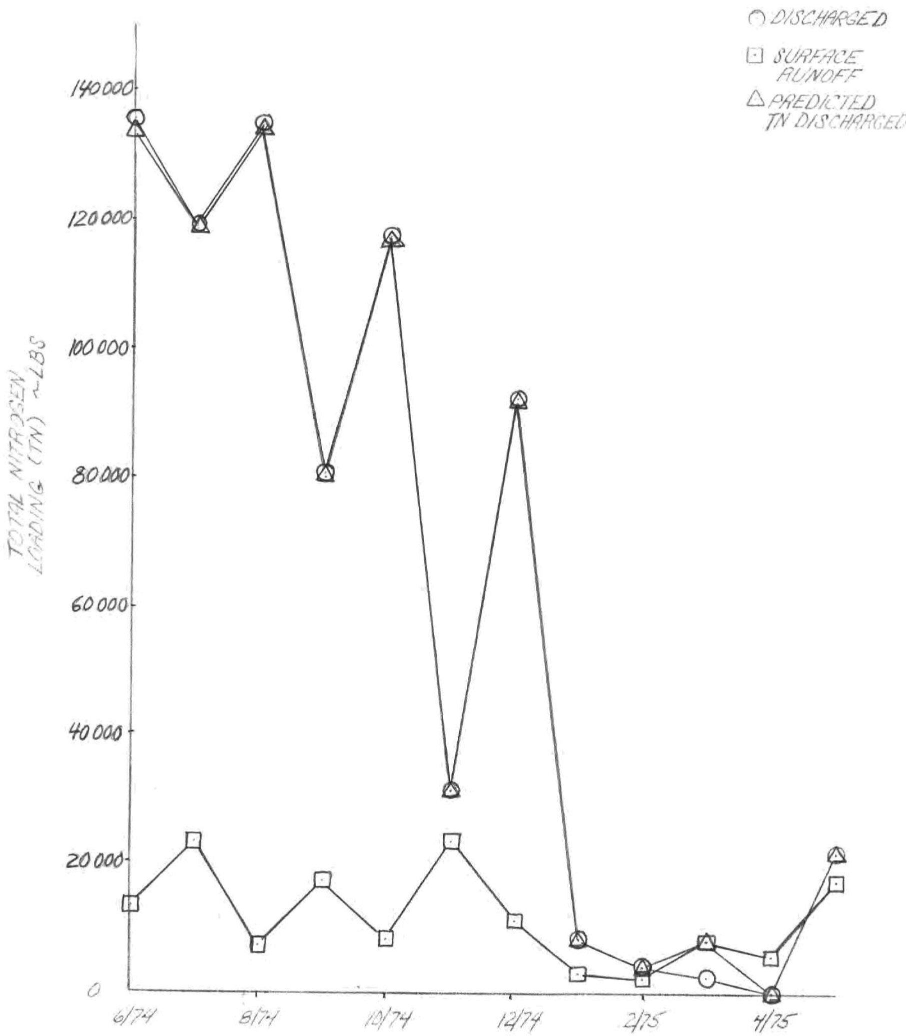
Unfortunately, all nutrient data in this basin, except for one $NO_3$ -N measurement = 0.34 mg/l at 23 ft. depth, is below 50 ft. Nutrient concentrations to depths of 200 ft. are reviewed for reference. The average total nitrogen -N and total phosphorus -P groundwater concentrations from this literature search are 1.22 and 0.08 mg/l respectively. The second investigative measure was taken to drill three shallow wells adjacent to C-51, collect samples and measure their nutrient concentrations. To date only one set of samples has been collected. The average total nitrogen and total phosphorus concentrations are 1.96 mg/l and 0.068 mg/l. For comparison the average other nonpoint sources and sinks concentrations for the data base period used in this analysis are 2.26 mg/l and 0.117 mg/l for total nitrogen -N and total phosphorus -P, respectively. A concentration summary for the data base period is given in Table 14.

The nutrients in rainfall that fall directly on surface water are also considered. Because of the relatively small areas of surface waters, these contributions are found to be negligible.

Table 13. West C-51 Quantities and Quality Data Base Period

| DATE | DISCHARGE | DATA BASE | | | | MODELED | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Nitrogen | | Total Phosphorus | | Total Nitrogen | | Total Phosphorus | |
| | (Ac-Ft) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) |
| June 74' | 11466 | 135555 | 4.35 | 2026 | 0.065 | 138413 | 4.44 | 2187 | 0.070 |
| July | 22746 | 119310 | 1.93 | 8098 | 0.131 | 123120 | 1.99 | 7924 | 0.128 |
| August | 27868 | 134815 | 1.78 | 5832 | 0.077 | 134474 | 1.78 | 5741 | 0.076 |
| September | 21697 | 80786 | 1.37 | 4010 | 0.068 | 81016 | 1.37 | 3959 | 0.067 |
| October | 26051 | 117529 | 1.66 | 8000 | 0.113 | 117207 | 1.66 | 7822 | 0.110 |
| November | 11677 | 31735 | 1.00 | 4221 | 0.133 | 32100 | 1.01 | 4157 | 0.131 |
| December | 13127 | 92401 | 2.59 | 3853 | 0.108 | 91811 | 2.57 | 3766 | 0.106 |
| January 75' | 3695 | 8335 | 0.83 | 1767 | 0.176 | 8288 | 0.83 | 1722 | 0.172 |
| February | 956 | 4027 | 1.55 | 127 | 0.049 | 4002 | 1.54 | 268 | 0.103 |
| March | 450 | 2446 | 2.00 | 138 | 0.113 | 8179 | 6.69 | 579 | 0.474 |
| April | 0 | 0 | 1.27 | 0 | 0.050 | 0 | - | 0 | - |
| May | 4407 | 21918 | 1.83 | 599 | 0.050 | 22020 | 1.84 | 1024 | 0.085 |
| Total Avg. | 144140 | 748857 | (1.91) | 38671 | (0.099) | 760630 | (1.94) | 39149 | (0.100) |

FIGURE 9
WEST C-51 BASIN
TOTAL NITROGEN LOADINGS FOR THE
DATA BASE PERIOD



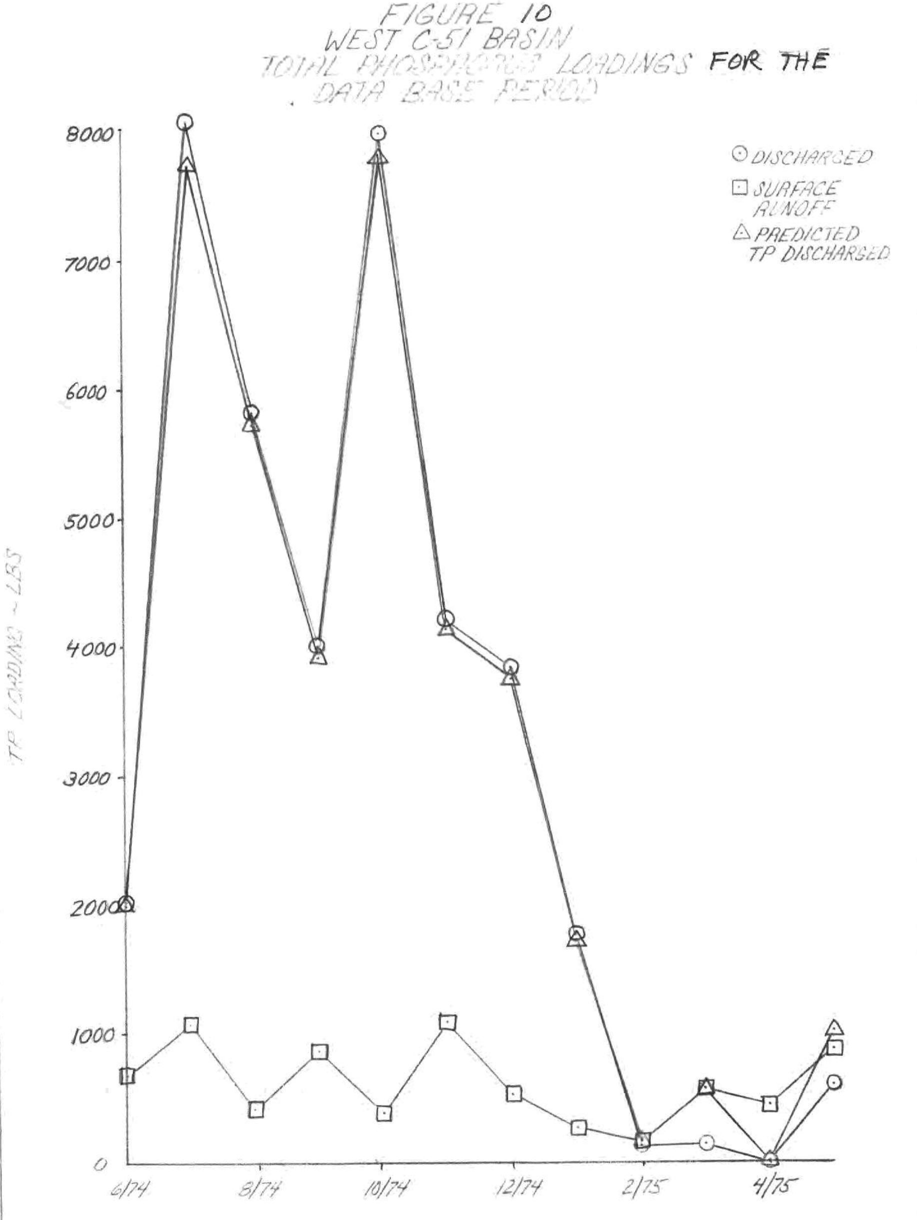


FIGURE 10
WEST C-51 BASIN
TOTAL PHOSPHORUS LOADINGS FOR THE
DATA BASE PERIOD
DISCHARGED
SURFACE RUNOFF
PREDICTED TP DISCHARGED
TP LOADINGS ~ LBS
8000
7000
6000
5000
4000
3000
2000
1000
0
6/74
8/74
10/74
12/74
2/75
4/75

Table 14. West C-51 Nutrient Concentrations Data Base Period Yearly Averages

| | Total Nitrogen (mg/l) | Total Phosphorus (mg/l) |
|---|---|---|
| Discharged | 1.91 | 0.099 |
| Modeled Discharge | 1.94 | 0.100 |
| Modeled ONPS* | 2.26 | 0.117 |
| STORM | 1.27 | 0.066 |
| Shallow Groundwater | | |
| Literature Search | 1.22 | 0.080 |
| Collected Data | 1.96 | 0.068 |

* Other nonpoint sources and sinks

These calculations for the west C-51 future basin discharges include no increased demands. These increases will be considered elsewhere in the backpumping evaluations.

All west C-51 model inputs and their results are given in Exhibits 7.1 and 7.2 for the 1973-74 and Exhibits 7.3 and 7.4 for plan scenario land uses.

(2) L-8 Basin

The L-8 Basin analysis assumed that there would be no land use changes within this basin. The results from this analysis are, therefore, used in both the 1973-74 and plan scenario land uses. Quantities available for backpumping are calculated from available USGS surface water data, and from M-Canal demands for the City of West Palm Beach. M-Canal demands are calculated from pumping hours as recorded in "West Palm Beach Water Department Source of Supply Reports" from 1/65 to 5/75. These demands are calculated by assuming a pumping rate of 12 Ac-Ft/hr/pump. By adding L-8 discharges (USGS data) and the calculated M-Canal demands, the total L-8 generated discharges are obtained. However, these discharges are not representative of what can be expected to be available for future backpumping. L-8 discharges must consider M-Canal demands. This was done by assuming any increased demands would be satisfied by Lake Okeechobee. Therefore, M-Canal demands from L-8 were not increased over present demands.

Several attempts were made to define M-Canal demands, including correlations to: the month of year, L-8 discharges, and the following rainfalls; accumulative, for the same month, for the present and preceding months, for the present and two preceding months, for the preceding month, and for the two preceding months. From the above, there were no clear cut correlations, however, it was found that maximum demands could be related to rainfall. The approach finally chosen to calculate quantities of water available from L-8 for backpumping was: for the rainfall record of 1969-74, use L-8 generated flows less the demands from that period; for the 1963-8 rainfall record, use L-8 generated flows less M-Canal demands as correlated to the rainfall of the two preceding months, see Figure 5. The 1969-74 period had some negative L-8 flows. These were taken to be zero since they obviously weren't generated on the basin. During months of both positive and negative flows only the positive flows were used.

The M-Canal demands in Figure 11 are shown to be 11400 Ac-Ft/month for no rainfall, and linearly reducing to 6,600 Ac-Ft/month for 22 inches of rainfall for the two preceding months. Above this 22 inches, it is assumed that M-Canal demands would be zero. When these demands exceed L-8 basin discharges, the available backpumped quantities are set equal to zero. As previously stated, this simply means these additional demands will be supplied from Lake Okeechobee. This approach may give low available discharges but it is conservative in estimating backpumped quantities. For no reason should these discharges be used for a flood protection analysis. When making flood protection calculations, the safest and most realistic assumption to make is that the M-Canal demands would be zero. These quantity calculations are shown in Exhibit 7.5.

Quality calculations for the L-8 basin were made from data available at the time of computations (12/76). These data and the monthly cocentrations used in loading calculations are listed in Table 16. For months when two data points are available, their average is used. When no data is available, the average of all the other data is substituted. The nutrient loadings, as shown in Table 15, are calculated from these concentrations and the aforementioned quantities.

(3) Total West Palm Beach Backpumped Basin

One area being analyzed for possible backpumping is the west C-51 plus the L-8 basins. This is titled the West Palm Beach Canal Backpumping Alternative. The quantities and quality of water from the total basin are simply

FIGURE 11
HISTORICAL M-CANAL DEMANDS FROM L-8

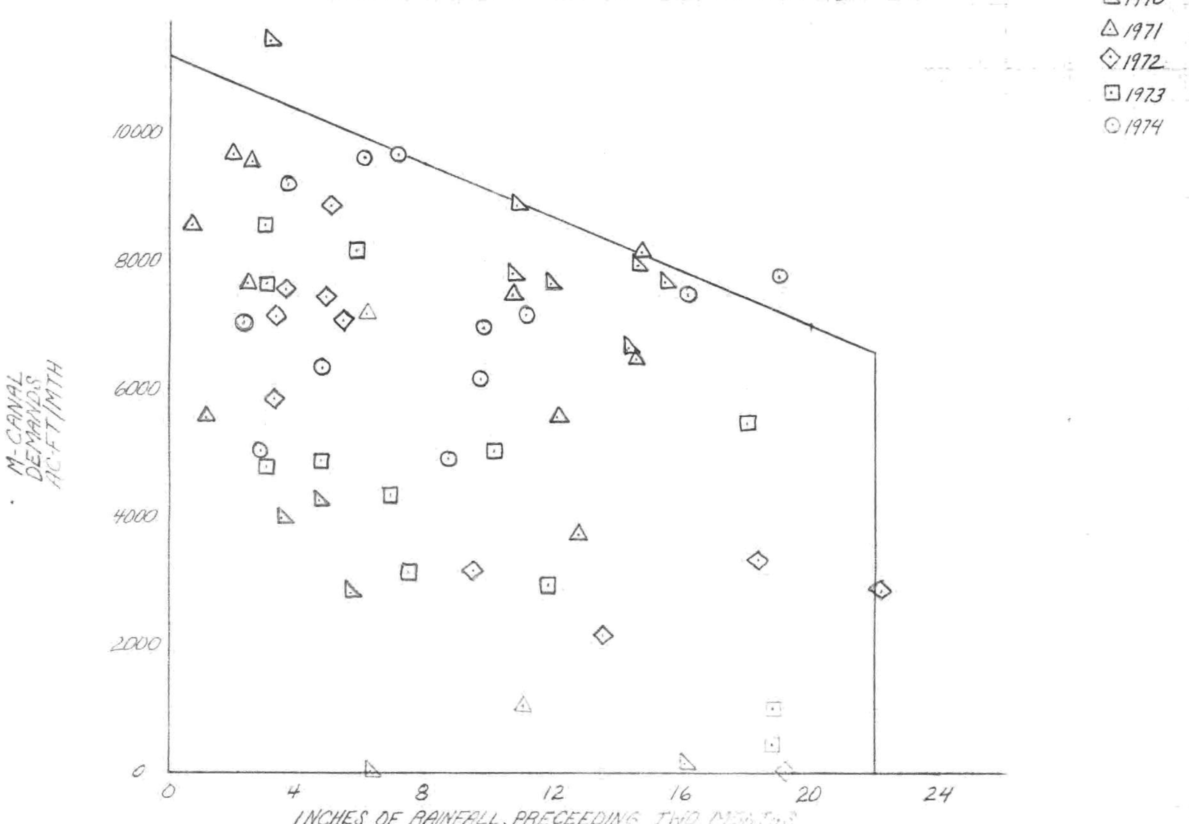


Table 15. L-8 Basin Available Backpumped Quantities and Nutrient Loadings

| Date | Historical M-Canal Demands (Ac-Ft) | Historical L-8 Discharges (Ac-Ft) | Historical L-8 Basin Dis. (Ac-Ft) | Future M-Canal Demands (Ac-Ft) | Future Available L-8 Dis. (Ac-Ft) | Total Nitrogen (lbs) | Total Phosphorus (lbs) |
|---|---|---|---|---|---|---|---|
| 1/63 | None | 9388 | Same | 10800 | 0 | 0 | 0 |
| 2 | | 10050 | as | 10900 | 0 | 0 | 0 |
| 3 | | 12309 | L-8 | 10400 | 1909 | 7938 | 280 |
| 4 | | 11423 | Discharges, | 10100 | 1323 | 5501 | 194 |
| 5 | | 8918 | | 10600 | 0 | 0 | 0 |
| 6 | | 12383 | | 9700 | 2683 | 12104 | 438 |
| 7 | | 7414 | | 8700 | 0 | 0 | 0 |
| 8 | | 7075 | | 9600 | 0 | 0 | 0 |
| 9 | | 6514 | | 9400 | 0 | 0 | 0 |
| 10 | | 9400 | | 8200 | 1200 | 4631 | 114 |
| 11 | | 2291 | | 8900 | 0 | 0 | 0 |
| 12/63 | | 3205 | | 10400 | 0 | 0 | 0 |
| 1/64 | None | 17821 | | 9400 | 8421 | 35016 | 1236 |
| 2 | | 12783 | | 9200 | 3583 | 14899 | 526 |
| 3 | | 7646 | | 10050 | 0 | 0 | 0 |
| 4 | | 5867 | | 9600 | 0 | 0 | 0 |
| 5 | | 6549 | | 9200 | 0 | 0 | 0 |
| 6 | | 9150 | | 9500 | 0 | 0 | 0 |
| 7 | | 8707 | | 9400 | 0 | 0 | 0 |
| 8 | | 17950 | | 8050 | 9900 | 45740 | 2556 |
| 9 | | 19940 | | 8500 | 11440 | 44150 | 1306 |
| 10 | | 23700 | | 8500 | 15200 | 58660 | 1446 |
| 11 | | 22620 | | 8400 | 14220 | 59130 | 2248 |
| 12/64 | | 21836 | | 8600 | 13236 | 55038 | 1943 |
| 1/65 | 36 | 17574 | 17610 | 10200 | 7410 | 30812 | 1087 |
| 2 | 48 | 12165 | 12213 | 10700 | 1513 | 6291 | 222 |
| 3 | 1872 | 13619 | 15491 | 10400 | 5091 | 21169 | 747 |
| 4 | 1770 | 5821 | 7591 | 10200 | 0 | 0 | 0 |
| 5 | 5424 | 4820 | 10244 | 10400 | 0 | 0 | 0 |
| 6 | 8472 | 8590 | 17062 | 10500 | 6562 | 29605 | 1070* |
| 7 | 5118 | 9802 | 14920 | 8100 | 6826 | 26900 | 557 |
| 8 | 2292 | 11782 | 14074 | 0 | 14074 | 65025 | 3634 |
| 9 | 1938 | 10802 | 12720 | 8200 | 4520 | 17440 | 516 |
| 10 | 0 | 30382 | 30382 | 9100 | 21283 | 82136 | 2025 |
| 11 | 12 | 27582 | 27594 | 7100 | 20482 | 85168 | 3006 |
| 12 | 1926 | 15656 | 17582 | 8200 | 9382 | 39012 | 1377 |

Table 15. (Continued)

| Date | Historical M-Canal Demands (Ac-Ft) | Historical L-8 Discharges (Ac-Ft) | Historical L-8 Basin Dis. (Ac-Ft) | Future M-Canal Demands (Ac-Ft) | Future Available L-8 Dis. (Ac-Ft) | Total Nitrogen (lbs) | Total Phosphorus (lbs) |
|---|---|---|---|---|---|---|---|
| 1/66 | 12 | 19918 | 19930 | 10700 | 9230 | 38380 | 1355 |
| 2 | 0 | 22417 | Same | 9500 | 12917 | 53711 | 1896 |
| 3 | 0 | 21031 | as | 8850 | 12181 | 50651 | 1788 |
| 4 | 0 | 7613 | L-8 | 9900 | 2287 | 9510 | 336 |
| 5 | 0 | 10435 | Discharges | 9700 | 735 | 3056 | 108 |
| 6 | 0 | 37773 | ↓ | 8650 | 29123 | 131389 | 4749 |
| 7 | 0 | 41427 | ↓ | 7000 | 34627 | 136457 | 2823* |
| 8 | 0 | 40717 | ↓ | 6900 | 33817 | 156242 | 8731 |
| 9 | 0 | 42982 | ↓ | 7500 | 35402 | 136625 | 4041 |
| 10 | 0 | 26628 | ↓ | 6900 | 9928 | 38315 | 944 |
| 11 | 1920 | 5355 | 7275 | 8450 | 0 | 0 | 0 |
| 12 | 0 | 8795 | 8795 | 10300 | 0 | 0 | 0 |
| 1/67 | 1446 | 8563 | 10009 | 10700 | 0 | 0 | 0 |
| 2 | 7776 | 4903 | 12679 | 10100 | 1979 | 8229 | 290 |
| 3 | 6696 | 6936 | 13632 | 10200 | 3432 | 14271 | 504 |
| 4 | 7824 | 2737 | 10561 | 10200 | 361 | 1501 | 53 |
| 5 | 9528 | 7888 | 17416 | 11000 | 6416 | 26679 | 942 |
| 6 | 6966 | 7367 | 14333 | 11200 | 3133 | 14135 | 511 |
| 7 | 1956 | 13317 | 15273 | 8600 | 6473 | 25312 | 523 |
| 8 | 0 | 12502 | 12502 | 0 | 12502 | 57762 | 2088 |
| 9 | 24 | 7503 | 7527 | 8100 | 0 | 0 | 0 |
| 10 | 12 | 12823 | 12835 | 8900 | 3935 | 15186 | 374 |
| 11 | 426 | 2870 | 3296 | 8500 | 0 | 0 | 0 |
| 12/67 | 6606 | 4735 | 11341 | 9900 | 1441 | 5992 | 211 |
| 1/68 | 3834 | 5820 | 9654 | 10600 | 0 | 0 | 0 |
| 2 | 7752 | 6881 | 14633 | 10400 | 4233 | 17602 | 621 |
| 3 | 5520 | 3423 | 8943 | 10400 | 0 | 0 | 0 |
| 4 | 9186 | 7139 | 16325 | 9800 | 6525 | 27132 | 958 |
| 5 | 6840 | 6450 | 13290 | 10300 | 2990 | 12433 | 439 |
| 6 | 0 | 51447 | 51447 | 9100 | 42583 | 191049 | 6905 |
| 7 | 42 | 48541 | 48583 | 0 | 48583 | 191455 | 3961 |
| 8 | 846 | 14067 | 14913 | 0 | 14913 | 68901 | 3850 |
| 9 | 792 | 10754 | 11546 | 8200 | 3346 | 12913 | 382 |
| 10 | 156 | 33537 | 33693 | 9100 | 24593 | 94910 | 2807 |
| 11 | 990 | 11948 | 12938 | 9100 | 3838 | 15959 | 563 |
| 12/68 | 1986 | 4473 | 6459 | 9700 | 0 | 0 | 0* |

Table 15. (Continued)

| Date | Historical M-Canal Demands (Ac-Ft) | Historical L-8 Discharges (Ac-Ft) | Historical L-8 Basin Dis. (Ac-Ft) | Future M-Canal Demands (Ac-Ft) | Future Available L-8 Dis. (Ac-Ft) | Total Nitrogen (lbs) | Total Phosphorus (lbs) |
|---|---|---|---|---|---|---|---|
| 1/69 | 5448 | 2085 | Calculation | Same | Same | 8670 | 306 |
| 2 | 7194 | 4514 | not | as | as | 18770 | 662 |
| 3 | 3906 | 20930 | necessary | Historical | Histor. | 87031 | 3072 |
| 4 | 5412 | 4993 | | Demands | Discharges | 20783 | 734 |
| 5 | 1530 | 5334 | | | | 22180 | 783 |
| 6 | 6882 | 16431 | | | | 74129 | 2679 |
| 7 | 4842 | 6373 | | | | 25115 | 520 |
| 8 | 456 | 10600 | | | | 48974 | 2737 |
| 9 | 1740 | 10223 | | | | 39453 | 1167 |
| 10 | 36 | 41810 | | | | 161355 | 3977 |
| 11 | 36 | 27106 | | | | 112712 | 3978 |
| 12/69 | 36 | 19228 | | | | 79954 | 2822 |
| 1/70 | 2808 | 14509 | | | | 60331 | 2129 |
| 2 | 3978 | 16467 | | | | 68473 | 2417 |
| 3 | 4236 | 43916 | | | | 182611 | 6445 |
| 4 | 282 | 38541 | | | | 160261 | 5656 |
| 5 | 6624 | 17484 | | | | 72702 | 2566 |
| 6 | 0 | 30914 | | | | 139469 | 5041 |
| 7 | 7920 | 20763 | | | | 81822 | 1693 |
| 8 | 7692 | 25866 | | | | 119507 | 6678 |
| 9 | 8886 | 31595 | | | | 121933 | 3606 |
| 10 | 7632 | 16792 | | | | 64804 | 1917 |
| 11 | 7806 | 607 | | | | 2524 | 89 |
| 12 | 11418 | 1704 | | | | 7086 | 250 |
| 1/71 | 8556 | 1042 | | | | 4331 | 153 |
| 2 | 7656 | 10 | | | | 42 | 2 |
| 3 | 9552 | 5963 | | | | 24799 | 875 |
| 4 | 5526 | 3362 | | | | 13980 | 493 |
| 5 | 9654 | 318 | | | | 1322 | 47 |
| 6 | 7194 | 250 | | | | 1128 | 41 |
| 7 | 3720 | 887 | | | | 3499 | 72 |
| 8 | 8124 | 137 | | | | 633 | 35 |
| 9 | 1044 | 12264 | | | | 47329 | 1440 |
| 10 | 7488 | 819 | | | | 3261 | 80 |
| 11 | 5550 | 4130 | | | | 17171 | 606 |
| 12/71 | 6468 | 845 | | | | 3514 | 124 |

Table 15. (Continued)

| Date | Historical M-Canal Demands (Ac-Ft) | Historical L-8 Discharges (Ac-Ft) | Historical L-8 Basin Dis. (Ac-Ft) | Future M-Canal Demands (Ac-Ft) | Future Available L-8 Dis. (Ac-Ft) | Total Nitrogen (lbs) | Total Phosphorus (lbs) |
|---|---|---|---|---|---|---|---|
| 1/72 | | 54 | Calculation | Same | Same | 225 | 8 |
| 2 | 7428 | 238 | not | as | as | 990 | 35 |
| 3 | 5894 | 224 | necessary | Histor. | Histor. | 931 | 33 |
| 4 | 7074 | 932 | | Demands | L-8 | 3875 | 137 |
| 5 | 2160 | 5617 | | | Discharge | 23357 | 824 |
| 6 | 0 | 9551 | | | | 43089 | 1557 |
| 7 | 2880 | 6839 | | | | 26951 | 558 |
| 8 | 3326 | 1113 | | | | 5142 | 287 |
| 9 | 3168 | 958 | | | | 3697 | 109 |
| 10 | 8772 | 280 | | | | 1079 | 32 |
| 11 | 7554 | 2 | | | | 8 | 0 |
| 12/72 | 7116 | 58 | | | | 241 | 9 |
| 1/73 | 7656 | 44 | | | | 181 | 6 |
| 2 | 4350 | 0 | | | | 0 | 0 |
| 3 | 3114 | 0 | | | | 0 | 0 |
| 4 | 4890 | 0 | | | | 0 | 0 |
| 5 | 8556 | 0 | | | | 0 | 0 |
| 6 | 4794 | 236 | | | | 1065 | 38 |
| 7 | 5034 | 9578 | | | | 37745 | 1425 |
| 8 | 5472 | 7113 | | | | 32864 | 1836 |
| 9 | 1008 | 7712 | | | | 29761 | 880 |
| 10 | 468 | 5455 | | | | 21050 | 519 |
| 11 | 2940 | 0 | | | | 0 | 0 |
| 12/73 | 8160 | 224 | | | | 931 | 33 |
| 1/74 | 6318 | 1004 | | | | 4173 | 147 |
| 2 | 4908 | 363 | | | | 1509 | 53 |
| 3 | 9258 | 91 | | | | 379 | 13 |
| 4 | 7020 | 0 | | | | 0 | 0 |
| 5 | 5088 | 0 | | | | 0 | 0 |
| 6 | 9192 | 1527 | | | | 6889 | 249 |
| 7 | 6972 | 11903 | | | | 46907 | 970 |
| 8 | 7758 | 10790 | | | | 49852 | 2786 |
| 9 | 7494 | 2123 | | | | 8191 | 242 |
| 10 | 7152 | 5381 | | | | 20767 | 512 |
| 11 | 6156 | 1337 | | | | 5560 | 196 |
| 12/74 | 9624 | 26 | | | | 108 | 4 |

Table 16 L-8 Quality Measured and Averaged Values

| Date or Month | Coding | Total Nitrogen-N (mg/1) | Total Phosphorus-P (mg/1) |
|---|---|---|---|
| 6/17/76 | BCE-122 | 1.66 | 0.060 |
| 7/15/76 | BCE-259 | 1.53 | 0.031 |
| 7/29/76 | BCE-329 | 1.38 | 0.029 |
| 8/13/76 | BCE-409 | 1.77 | 0.047 |
| 8/26/76 | BCE-484 | 1.63 | 0.143 |
| 9/9/76 | BCE-531 | 1.42 | 0.050 |
| 9/21/76 | BCE-595 | 1.42 | 0.034 |
| 10/6/76 | BCE-664 | - | 0.035 |
| January | | 1.53 | 0.054 |
| February | | 1.53 | 0.054 |
| March | | 1.53 | 0.054 |
| April | | 1.53 | 0.054 |
| May | | 1.53 | 0.054 |
| June | | 1.66 | 0.060 |
| July | | 1.45 | 0.030 |
| August | | 1.70 | 0.095 |
| September | | 1.42 | 0.042 |
| October | | 1.42 | 0.035 |
| November | | 1.53 | 0.054 |
| December | | 1.53 | 0.054 |

the sum of the two subbasins. Results for the 1973-74 and plan scenario land uses are presented in Exhibits 7.3 and 7.4, respectively. These predictions represent the maximum quantities available for backpumping, with their corresponding loadings and concentrations. The dates are indicative only of a rainfall record, and are not indicative of historical conditions. These exhibits include the results of the west C-51 basin as calibrated in February 1977 plus the previous (12/76) L-8 calculations. These estimates can be updated with additional L-8 quality data.

4.1.2 SUMMARY

1) Available discharges for backpumping and the loadings and concentrations for the West Palm Beach canal backpumping alternative (West C-51 plus L-8) are predicted for 1973-74 and plan scenario land uses.

2) Historical discharges are calculated from available USGS surface water data. Future discharges are estimated from these discharges for the same rainfall record with changes in land uses.

3) All quality predictions are based on the data base period when the quality data were collected (from 6/74 to 5/75 for the West C-51 basin, and from 6/76 to 10/76 for the L-8 basin).

4) The CLAD model is used to predict plan scenario water quantities and qualities and 1973-74 land use water quality from the west C-51 basin for the rainfall/discharge record of 1/63 to 12/74.

5) Increased future demands from the west C-51 basin are not included in these predictions. They must be considered in subsequent analyses.

6) The L-8 basin analysis assumed there would be no land use changes in this basin. These quantity and quality predictions are done by calculating

L-8 generated discharges, subtracting present M-Canal demands, and using available quality data to calculate loadings and concentrations.

7) Any additional M-Canal demands on the L-8 basin are assumed to be supplied by Lake Okeechobee. Present M-Canal demands, as defined herein, are taken from historical discharges to find the quantities of water availble for backpumping from this basin.

8) Maximum M-Canal demands are correlated to the sum of the two preceding months of rainfall. No direct correlations to demands are found. The resultant predicted L-8 discharges available for backpumping are, therefore, minimums. This provides a conservative estimate.

9) Under no circumstances should these flows be used in flood protection analyses. This is because of the conservative L-8 discharge calculations, as above, and more importantly because of the monthly time step.

10) These predictions are done with a fairly consistent level of accuracy. To get better predictions a much more detailed analysis to a greatly expanded data base would be necessary.

11) Shallow groundwater quality in the west C-51 basin was investigated. The results are included.

12) The water quality and quantity effects of grassed swales and detention basins are included in this analysis.

13) There is much uncertainty concerning nonpoint sources of pollution.

14) All model inputs, assumptions, and supporting investigations made on this basin are incorporated in this report.

## 4.2 Western Tamiami Canal (C-4) Basin with Snapper Creek

### 4.2.1 Discussion

In conjunction with the backpumping studies, the west Tamiami basin discharges and nutrient water quality are estimated for two land uses: 1973-74 and pattern scenario. The basin discharge CLAD model is used. Figure 6 shows the west C-4 basin boundaries.

Land uses have been aggregated or expanded for use in the model as shown in Table 17. Future land use projections had one nonurban land use: agriculture and open space. This is divided into three land uses: cultivated, open and water. Both cultivated and water are assumed to be the same area as in the 1973-74 land uses, the remainder is assumed open space.

Pollutant accumulation rates (lbs/acre/day) and depression storages (interception plus surface ponding) are correlated to land uses. Depression stoarges, as in the WPCF manual of Practice No. 9, are assumed to be 0.1" for urban areas and for nonurban areas; 0.3" for forest; 0.2" for pasture; 0.1" for high intensity (smooth) cultivated; and 0.3" for low intensity cultivated. The area weighted nonurban depression storages are calculated to be 0.24" and 0.30" for 1973-74 and pattern scenario land uses, respectively. The pollutant accumulation rates used in this analysis are listed in Table 18. The nonurban loading rates are area weighted averages. All total phosphorus loading rates have been reduced by approximately a factor of 10. The surface runoff calibration of phosphorus showed excessive amounts of phosphorus relative to what was being discharged. This is probably a result of the high soil transmissivities which allows the phosphorus to chemically react with and get absorbed into the soils.

The exponents for dust and dirt washoffs used are 4.6 and 0.46 for urban and nonurban land uses, respectively. These are arrived at by calibrating

Table 17. West Tamiami Land Uses

| | 1973-4 LAND COVER | | PATTERN SCENARIO | |
|---|---|---|---|---|
| | Area (Acres) | Percent Imperviousness (Area Weighted) | Area (Acres) | Percent Imperviousness (Area Weighted) |
| URBAN | | | | |
| Single Family | 7717 | 34.0 | 18335 | 35.0 |
| Multiple Family | 854 | 79.6 | 1022 | 65.0 |
| Commercial | 142 | 85.0 | 690 | 85.0 |
| Industrial | 1391 | 79.6 | 3457 | 61.0 |
| Open or park | 3739 | 5.0 | 1366 | 5.0 |
| Total Urban | 13843 | | 24870 | |
| NONURBAN | | | | |
| Cultivated | 2354 | | 4930 | |
| Pasture | 11488 | | 0 | |
| Woodland | 12366 | | 10251 | |
| Total Nonurban | 26208 | | 15181 | |
| Total Basin | 40051 | | 40051 | |

Table 18. Pollutant Accumulation Rates (lbs/acre/day) for the Tamiami Basin.

| | $BOD_5$ | Total Nitrogen | Total Phosphorus | Suspended Solids |
|---|---|---|---|---|
| URBAN | | | | |
| Single Family | 0.0446 | 0.00562 | 0.000125 | 0.0 |
| Multiple Family | 0.106 | 0.0234 | 0.000409 | 0.0 |
| Commercial | 0.488 | 0.0312 | 0.001137 | 0.0 |
| Industrial | 0.176 | 0.0495 | 0.000735 | 0.0 |
| Open or Park | 0.0122 | 0.00758 | 0.000026 | 0.0 |
| NONURBAN | | | | |
| Pasture | 0.0269 | 0.0130 | 0.000078 | 2.054 |
| Cultivated | 0.0440 | 0.0636 | 0.000274 | 10.268 |
| Woodland | 0.0122 | 0.00758 | 0.000026 | 0.240 |
| NONURBAN AREA WEIGHTED | | | | |
| 1973-74 Land Use | 0.0244 | 0.0168 | 0.0000774 | 1.993 |
| Pattern Scenario | 0.0218 | 0.0254 | 0.0001052 | 3.483 |

STORM's output to the trends and limits in the data base for Total Nitrogen and Total Phosphorus. The following combinations of urban and nonurban exponents were tried: 15,4.6; 15,0.46; 15,0.05; 4.6,4.6; 4.6,0.46; 4.16,0.05; 0.46,4.6; 0.46,0.46; 0.46,0.05.

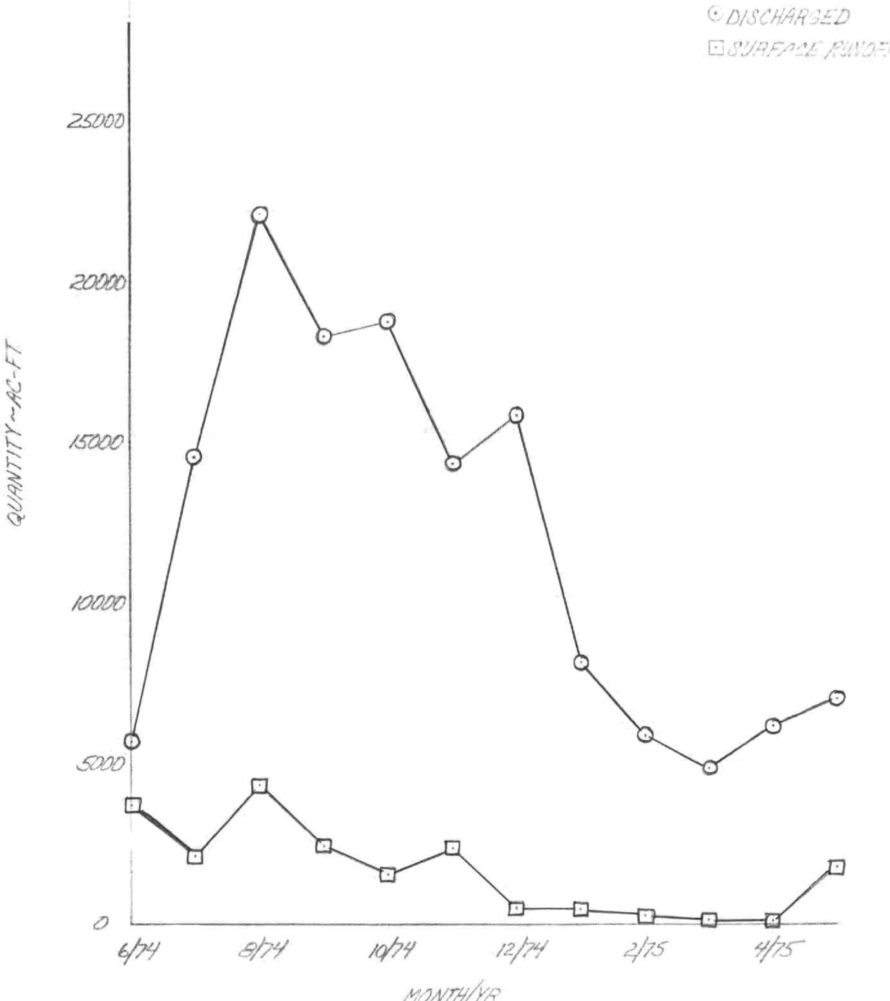
The rainfall data used in this basin's analysis is that of Miami airport. This hourly precipitation data is stored on tape at FSU in Tallahassee (location RI1098, number 7782, file 3), or is available on cards.

The runoff data used in this basin's analysis are 0.10 for urban pervious areas, 0.9 for urban impervious areas, 0.10 for nonurban areas, and 0.40 for urban impervious areas with grassed swale drainage. For the 1973-74 and pattern scenario land uses, the area weighted runoff coefficients are calculated to be 0.181 and 0.245 respectively. The low runoff coefficients are a result of the highly pervious soils. Figure 12 illustrates the resultant proportionment of surface runoff to discharges for the data base period.

When estimating the future urban areas runoff coefficients, ninety percent of future developments are assumed to have grassed swales, the remaining ten percent to have curb and gutter drainage. The area to be developed, calculated from the differences in the pattern scenario and 1973-74 land uses, is 13,400 acres. The resultant impervious runoff coefficient calculated by area weighting is 0.658.

This analysis assumed no abatement measures would be required of nonurban land uses. Two probable abatement measures have been included as nutrient sinks for future urban developments: grassed swales and detention basins. It is assumed that 50% of the newly developed urban areas will be required to have detention basins and 90% will have grassed swales. Removal efficiencies were calculated as before to be 14.7% for Total Nitrogen and Total Phosphorus.

FIGURE 12
WEST TAMIAMI BASIN QUANTITIES FOR THE DATA BASE PERIOD



Potential evaporation rates are used to calculate future surface water evaporations by assuming detention basins would use 10% of the development's land areas (See Table 11).

Historical discharges (1963-75) from the west Tamiami basin are calculated from available USGS surface water data. This is done simply by adding the discharges as recorded in the Tamiami Canal near Coral Gables (02289500) plus that in the Snapper Creek Canal at Miller Drive (02290610).

Future discharge calculations are made from historical discharges, surface runoff calculations, depression storage evapotranspirations, surface water evapotranspirations and are correlated to the increase in impervious cover. This increased fraction imperviousness is calculated to be 0.145 or 14.5 percent.

Quality calculations are based on one year of bimonthly data from 6/74 to 5/75, see Table 19. Monthly nutrient values are obtained by simply averaging all collection stations. Alternative approaches are possible, but as before, this simple average should suffice.

The quality calculations are made with a mass balance approach. Yearly discharged nutrients from the CLAD model are equated to the calculated loadings from the data base. Table 20 and Figures 13 and 14 present the resultant model outputs with the quality data for the calibration period (6/75-5/75). The total discharged pollutants are equated to the sum of those in surface runoff plus those from other nonpoint sources and sinks. These other nonpoint concentrations are set to match yearly and monthly loadings. These concentrations aren't well understood, they are therefore assumed constant in this analysis.

Any point sources must be included external to the program. Future point source contributions are assumed to be zero.

These future discharge calculations don't include increased demands. These increases are considered elsewhere in the backpumping evaluations.

Table 19. West Tamiami Basin Surface Water Quality Data

| Date | TKN (mg/l) | No. TKN Samples | $NO_3$-N (mg/l) | No. $NO_3$ Samples | $NO_2$-N (mg/l) | No. $NO_2$ Samles | Total N =TKN+$NO_x$ (mg/l) | Total P (mg/l) | No. TP Samples |
|---|---|---|---|---|---|---|---|---|---|
| June 74' | 1.11 | 6 | 0.091 | 6 | 0.008 | 6 | 1.21 | 0.019 | 6 |
| July | 1.84 | 3 | 0.039 | 3 | 0.010 | 3 | 1.89 | 0.013 | 3 |
| August | 1.79 | 2 | 0.097 | 4 | 0.011 | 4 | 1.90 | 0.010 | 4 |
| September | 1.29 | 4 | 0.080 | 7 | 0.020 | 7 | 1.39 | 0.014 | 7 |
| October | 1.62 | 9 | 0.141 | 9 | 0.011 | 9 | 1.77 | 0.021 | 9 |
| November | 1.39 | 6 | 0.499 | 6 | 0.013 | 6 | 1.90 | 0.010 | 6 |
| December | 1.10 | 3 | 0.121 | 3 | 0.007 | 3 | 1.23 | 0.002 | 3 |
| January 75' | 1.31 | 6 | 0.194 | 6 | 0.020 | 6 | 1.52 | 0.019 | 6 |
| February | 1.19 | 3 | 0.371 | 3 | 0.032 | 3 | 1.59 | 0.085 | 3 |
| March | 1.08 | 5 | 0.183 | 5 | 0.020 | 5 | 1.28 | 0.081 | 5 |
| April | 1.27 | 9 | 0.065 | 9 | 0.006 | 9 | 1.34 | 0.011 | 9 |
| May | 1.50 | 6 | 0.073 | 6 | 0.009 | 6 | 1.58 | 0.015 | 6 |

Table 20. West Tamiami Basin Quantities and Quality Data Base Period

| DATE | DISCHARGE | DATA BASE | | | | MODELED | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Nitrogen | | Total Phosphorus | | Total Nitrogen | | Total Phosphorus | |
| | (Ac-Ft) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) |
| June 74' | 5740 | 18876 | 1.21 | 296 | 0.019 | 18843 | 1.21 | 298 | 0.019 |
| July | 14464 | 74296 | 1.89 | 511 | 0.013 | 74255 | 1.89 | 510 | 0.013 |
| August | 22120 | 114223 | 1.90 | 782 | 0.010 | 114200 | 1.90 | 796 | 0.013 |
| September | 18332 | 69253 | 1.39 | 698 | 0.014 | 69005 | 1.39 | 702 | 0.014 |
| October | 18766 | 90273 | 1.77 | 1071 | 0.021 | 89998 | 1.76 | 1053 | 0.021 |
| November | 14339 | 74043 | 1.90 | 390 | 0.010 | 74096 | 1.90 | 380 | 0.010 |
| December | 15840 | 52951 | 1.23 | 86 | 0.002 | 52907 | 1.23 | 100 | 0.002 |
| January 75' | 8150 | 33668 | 1.52 | 421 | 0.019 | 33666 | 1.52 | 419 | 0.019 |
| February | 5890 | 25452 | 1.59 | 1361 | 0.085 | 25376 | 1.59 | 1365 | 0.085 |
| March | 4920 | 17115 | 1.28 | 1083 | 0.081 | 17107 | 1.28 | 1079 | 0.081 |
| April | 6217 | 22641 | 1.34 | 186 | 0.011 | 22621 | 1.34 | 184 | 0.011 |
| May | 7060 | 30316 | 1.58 | 288 | 0.015 | 30204 | 1.57 | 282 | 0.015 |
| Total (Avg) | 141838 | 623107 | (1.62) | 7173 | (0.019) | 622278 | (1.61) | 7168 | (0.019) |

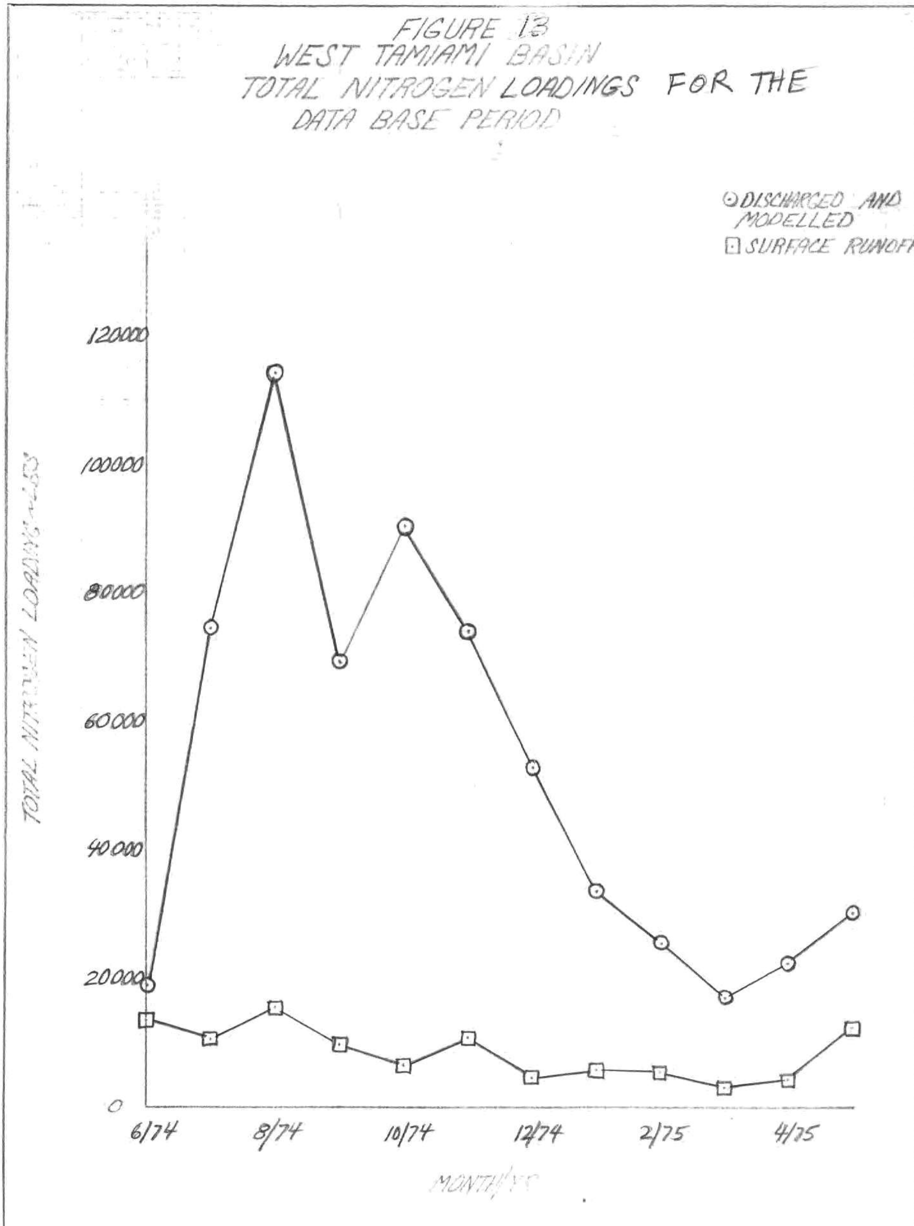
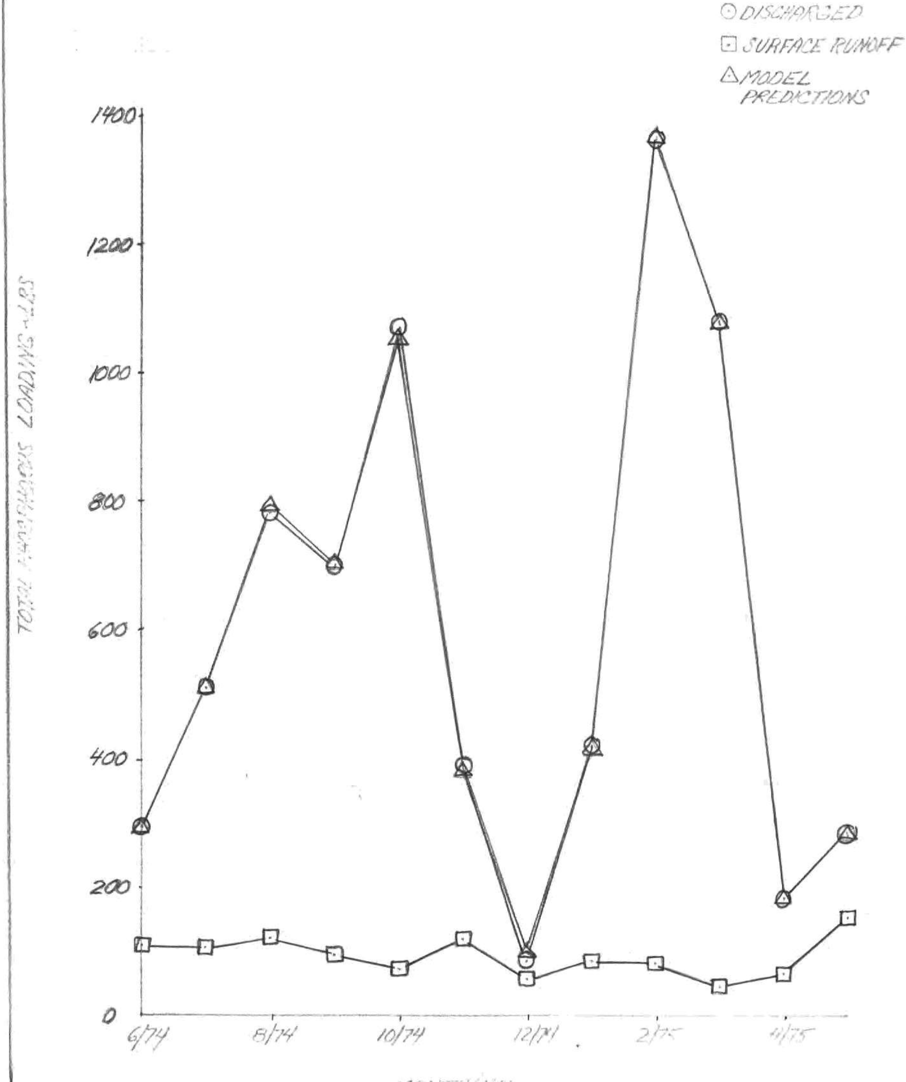


FIGURE 13
WEST TAMIAMI BASIN
TOTAL NITROGEN LOADINGS FOR THE
DATA BASE PERIOD
DISCHARGED AND MODELLED
SURFACE RUNOFF
120000
100000
80000
60000
40000
20000
0
6/74
8/74
10/74
12/74
2/75
4/75

FIGURE 14
WEST TAMIAMI BASIN
TOTAL PHOSPHORUS LOADINGS FOR THE DATA BASE PERIOD



All west Tamiami model inputs and their results are given in Exhibits 7.6, 7.7, 7.8 and 7.9 for the 1973-74 and plan scenario land uses.

4.2.2 Summpar for C-4 Basin

1) Estimates of the available discharges, their loadings and concentrations for the west Tamiami backpumping alternative for 1973-74 and pattern scenario are made with the use of the CLAD model.

2) All quality predictions are based on the data base. Quality data were collected from 6/74 to 5/75 for the west C-4 basin.

3) The CLAD model is used to predict pattern scenario water quantities and nutrient quality, and 1973-74 land use nutrient quality from the west Tamiami basin for the rainfall/discharge record of 1/63 to 12/74.

4.3 Hillsboro Canal (C-14) Basin

4.3.1 Discussion

In conjunction with the backpumping studies, the west Hillsboro plus C-14 basin discharges and nutrient water quality are estimated for two land uses: 1973-74 and plan scenario (see Figure 10). The basin discharge CLAD model is used.

The land uses have been aggregated for use in the model as shown in Table 21.

Pollutant accumulation rates (lbs/acre/day) and depression storages (interception plus surface ponding) are correlated to land uses. Depression storages, as in the WPCF manual of Practice No. 9, are assumed to be 0.1" for high intensity (smooth) cultivated, and 0.3" for low intensity cultivated. The area weighted nonurban depression storages were calculated to be 0.23" and 0.30" for 1973-74 and plan scenario land uses, respectively. The pollutant accumulation rates used in this analysis are listed in Table 22. These loading rates are half of those as in Table 2. The surface runoff calibration gave a better correlation

Table 21. Hillsboro + C-14

| | 1973-74 LAND COVER | | PLAN SCENARIO | |
|---|---|---|---|---|
| | Area (Acres) | Percent Imperviousness (Area Weighted) | Area (Acres) | Percent Imperviousness (Area Weighted) |
| URBAN | | | | |
| Single Family | 5727 | 39.2 | 64543 | 22.7 |
| Multiple Family | 546 | 70.8 | 2544 | 65.0 |
| Commercial | 289 | 87.1 | 1513 | 84.6 |
| Industrial | 2620 | 10.8 | 3065 | 65.6 |
| Open or park | 19540 | 5.0 | 3253 | 19.6 |
| Total Urban | 28722 | | 74918 | |
| NONURBAN | | | | |
| Cultivated | 17390 | | 1740 | |
| Pasture | 14329 | | | |
| Woodland | 19718 | | 3501 | |
| Total Nonurban | 51437 | | 5241 | |
| Total Basin | 80159 | | 80159 | |

Table 22. Pollutant Accumulation Rates (lbs/acre/day) ·Hillsboro plus C-14 Basin

| | $BOD_5$ | Total Nitrogen | Total Phosphorus | Suspended Solids |
|---|---|---|---|---|
| URBAN | | | | |
| Single Family | 0.0223 | 0.00281 | 0.000585 | 0.0 |
| Multiple Family | 0.0530 | 0.0117 | 0.001915 | 0.0 |
| Commercial | 0.244 | 0.0156 | 0.00535 | 0.0 |
| Industrial | 0.0880 | 0.02475 | 0.003445 | 0.0 |
| Open or Park | 0.0061 | 0.00379 | 0.000122 | 0.0 |
| NONURBAN | | | | |
| Pasture | 0.01345 | 0.00650 | 0.0003665 | 1.027 |
| Cultivated | 0.0220 | 0.0318 | 0.001285 | 5.134 |
| Woodland | 0.0061 | 0.00379 | 0.000122 | 0.120 |
| NONURBAN AREA WEIGHTED | | | | |
| 1973-74 Land Uses | 0.0135 | 0.01401 | 0.000583 | 4.136 |
| Plan Scenario | 0.0114 | 0.01309 | 0.000508 | 3.569 |

to the discharged loadings with these reduced loading rates. These pollutant accumulation rates were input to STORM in lbs/acre/day as previously explained.

The exponents for dust and dirt washoffs used are 4.6 and 0.46 for urban and nonurban land uses, respectively. These are arrived at by calibrating STORM's output to the trends and limits in the data base for Total Nitrogen and Total Phosphorus. The following combinations of urban and nonurban exponents were tried: 14,4.6; 15,0.46; 15,0.05; 4.6,4.6; 4.6,0.46; 4.6,0.05; 0.46,4.6; 0.46,0.46; 0.46,0.05.

The rainfall data used in this basin analysis is that of the Boca Raton station. This hourly precipitation data is stored on tape at FSU in Tallahassee (location RI1098, number 7782, file 4), or is available on cards.

The runoff coefficients used in this analysis are: 0.20 for urban pervious areas, 0.90 for urban impervious areas, 0.23 for nonurban areas, and 0.40 for urban impervious areas with grassed swale drainage. For the 1973-74 and plan scenario land uses, the area weighted runoff coefficients are calculated to be 0.255 and 0.284, respectively. Figure 15 illustrates the resultant proportionment of surface runoff to discharges for the data base period.

When estimating the future urban areas runoff coefficients, ninety percent of future developments are assumed to have grassed swales, the remaining ten percent to have curb and gutter drainage. The area to be developed, calculated from the differences in the plan scenario and 1973-74 land uses, is 62483 acres. The resultant impervious runoff coefficient is 0.525.

This analysis assumed no abatement measure would be required for nonurban land uses. Two probable abatement measures are included as nutrient sinks for future urban developments: grassed swales and detention basins. It is assumed that 50% of the newly developed urban areas will be required to have detention basins and 90% will have grassed swales. Removal efficiencies are calculated to be 22.7% for Total Nitrogen and Total Phoshorus.

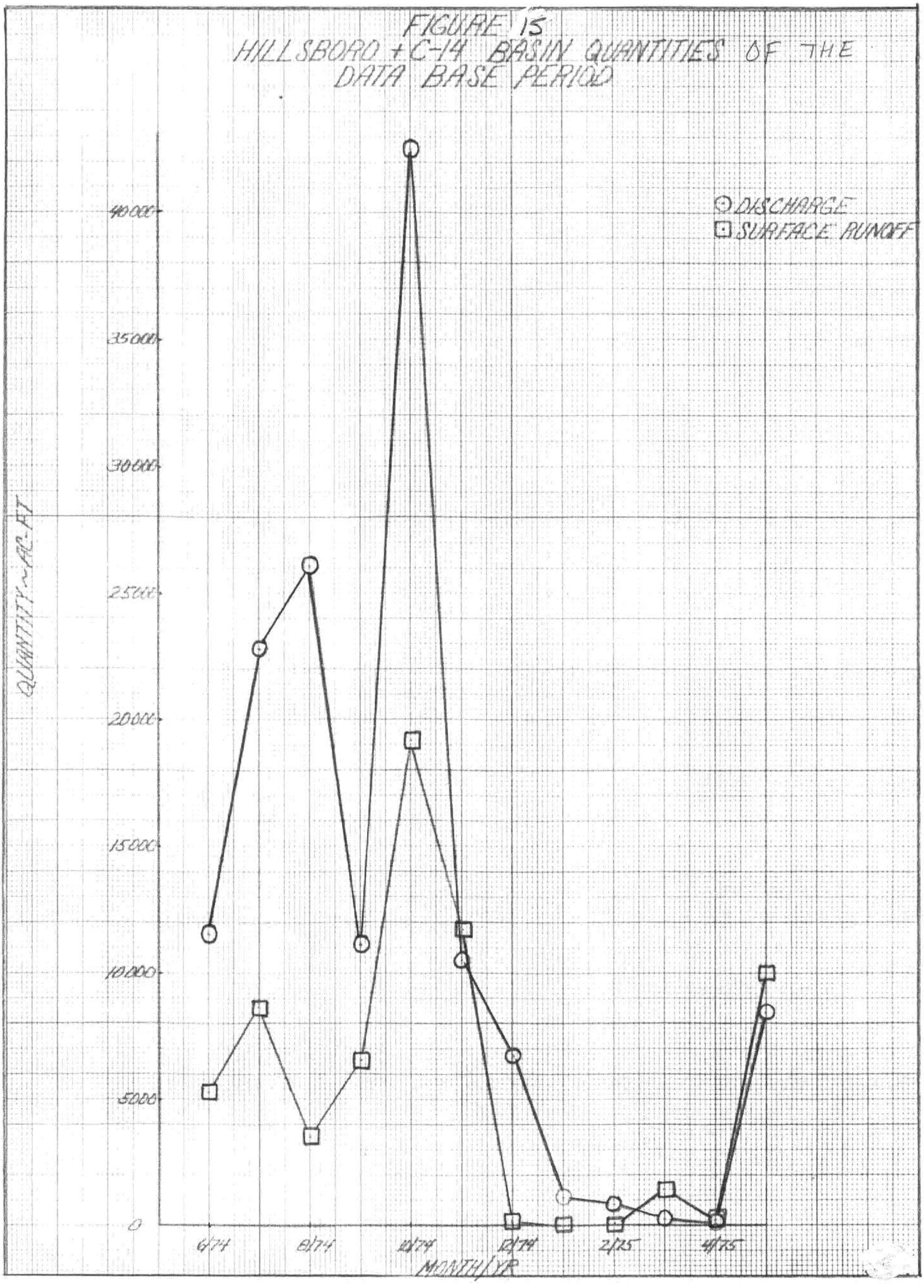


FIGURE 15
HILLSBORO + C-14 BASIN QUANTITIES OF THE DATA BASE PERIOD
DISCHARGE
SURFACE RUNOFF
QUANTITY ~ AC-FT
40000
35000
30000
25000
20000
15000
10000
5000
0
6/74
8/74
10/74
12/74
2/75
4/75
MONTH/YR

Potential evaporation rates of Table 11 are used to calculate future surface water evaporations by assuming detention basins would use 10% of the new developments land area.

Historical discharges are calculated by the Water Resources Division using the positive differences in flow between the Deerfield Locks (02281500, Hillsboro Canal near Deerfield Beach) and S39 (Hillsboro near Deerfield) plus the positive differences in flow between S37A (02282100, Cypress Creek Canal) and S-38 (Conservation Area 2). This is done on a daily basis.

Future discharge calculations are made from historical discharges, surface runoff calculations, depression storage evapotranspiration, and surface water evapotranspiration and are correlted to the increase in impervious cover. This increased fraction imperviousness is calculated as 0.144 or 14.4 percent.

Quality calculations are based on one year of bimonthly data from 6/74 to 5/75, see Table 23. Monthly nutrient values are obtained by simply averaging the 3 collection stations.

The quality calculations are made with a mass balance approach. Yearly discharged nutrients from the CLAD model are equated to the calculated loadings from the data base. Table 24 and Figures 16 and 17 present the resultant model outputs with the quality data for the calibration period (6/75 - 5/75). Total discharged pollutants are equated to the sum of those in surface runoff plus those from other nonpoint sources and sinks. These other nonpoint concentrations are set to match yearly and monthly loadings.

All Hillsboro plus C-14 model inputs and their results are given in Exhibits 7.10, 7.11, 7.12 and 7.13 for the 1973-74 and plan scenario land uses.

4.3.2 Summary

1) Estimates of the available discharges, and their loadings and concentrations for the Hillsboro plus C-14 backpumping alternative for 1973-74 and plan scenario land uses are made with the use of the CLAD model.

Table 23. Hillsboro + C-14 Surface Water Quality Data

| Date | TKN (mg/l) | No. TKN Samples | $NO_3$-N (mg/l) | No. $NO_3$ Samples | $NO_2$-N (mg/l) | No. $NO_2$ Samples | Total N = TKN+$NO_x$ (mg/l) | Total P (mg/l) | No. TP Samples |
|---|---|---|---|---|---|---|---|---|---|
| June 74' | 1.29 | 6 | 0.046 | 6 | 0.010 | 6 | 1.35 | 0.035 | 6 |
| July | 2.19 | 3 | 0.052 | 3 | 0.010 | 3 | 2.25 | 0.069 | 3 |
| August | 2.08 | 6 | 0.048 | 6 | 0.009 | 6 | 2.14 | 0.250 | 6 |
| September | 1.36 | 3 | 0.032 | 6 | 0.006 | 6 | 1.40 | 0.124 | 6 |
| October | 1.40 | 9 | 0.048 | 9 | 0.011 | 9 | 1.46 | 0.251 | 9 |
| November | 0.92 | 6 | 0.138 | 5 | 0.011 | 6 | 1.07 | 0.109 | 6 |
| December | 1.06 | 3 | 0.270 | 3 | 0.019 | 3 | 1.35 | 0.186 | 3 |
| January 75' | 1.24 | 6 | 0.057 | 6 | 0.015 | 6 | 1.31 | 0.056 | 6 |
| February | 1.26 | 3 | 0.017 | 3 | 0.019 | 3 | 1.30 | 0.042 | 3 |
| March | 1.13 | 6 | 0.039 | 5 | 0.010 | 6 | 1.18 | 0.042 | 6 |
| April | 1.39 | 6 | 0.012 | 6 | 0.005 | 6 | 1.41 | 0.028 | 6 |
| May | 1.80 | 9 | 0.045 | 9 | 0.009 | 9 | 1.85 | 0.048 | 9 |

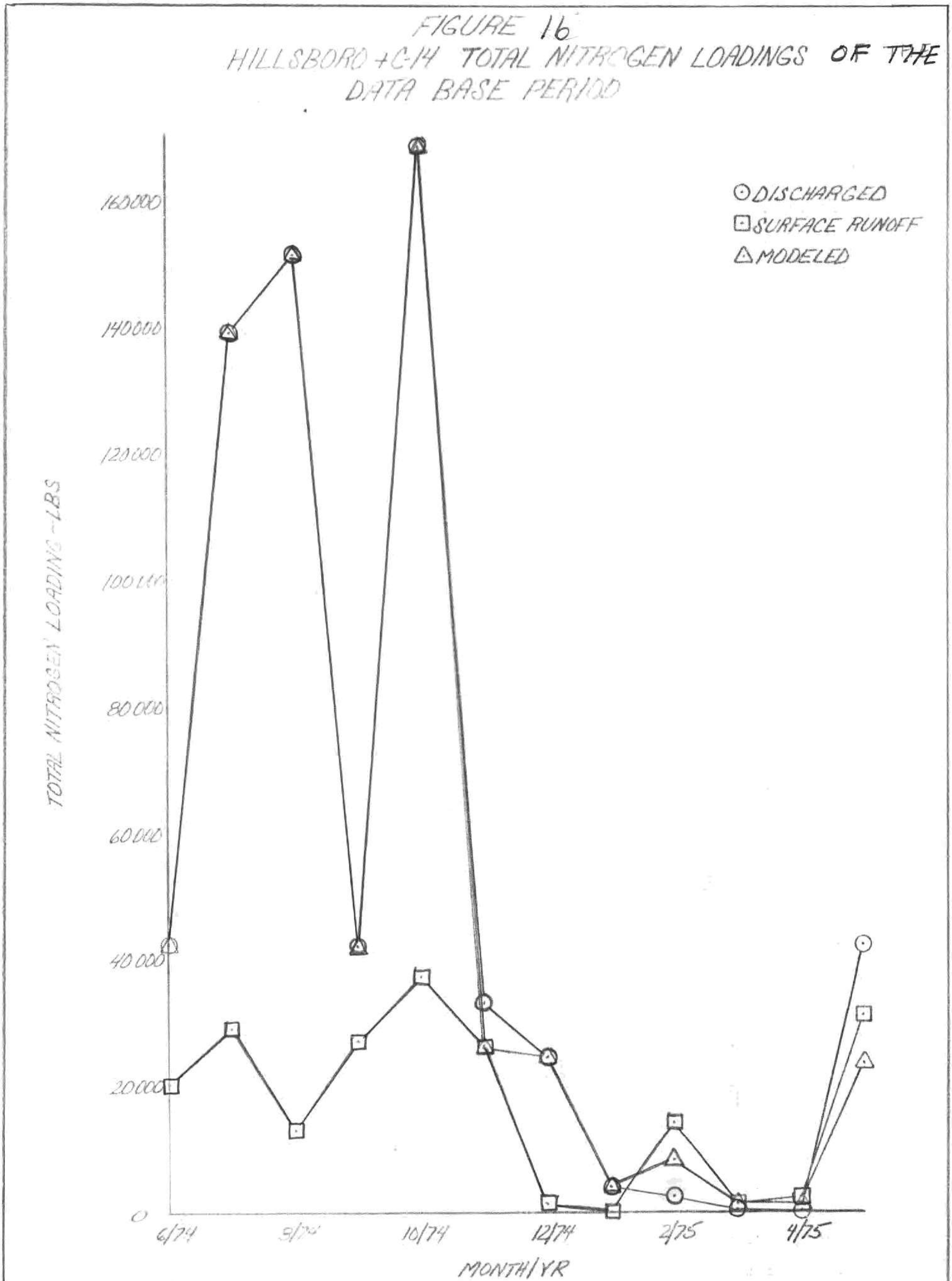


FIGURE 16
HILLSBORO + C-14 TOTAL NITROGEN LOADINGS OF THE
DATA BASE PERIOD
DISCHARGED
SURFACE RUNOFF
MODELED
TOTAL NITROGEN LOADING - LBS
160000
140000
120000
80000
60000
40000
20000
0
6/74
10/74
12/74
2/75
4/75
MONTH/YR

FIGURE 17
HILLSBORO + C-14 TOTAL PHOSPHORUS LOADINGS
DATA BASE PERIOD

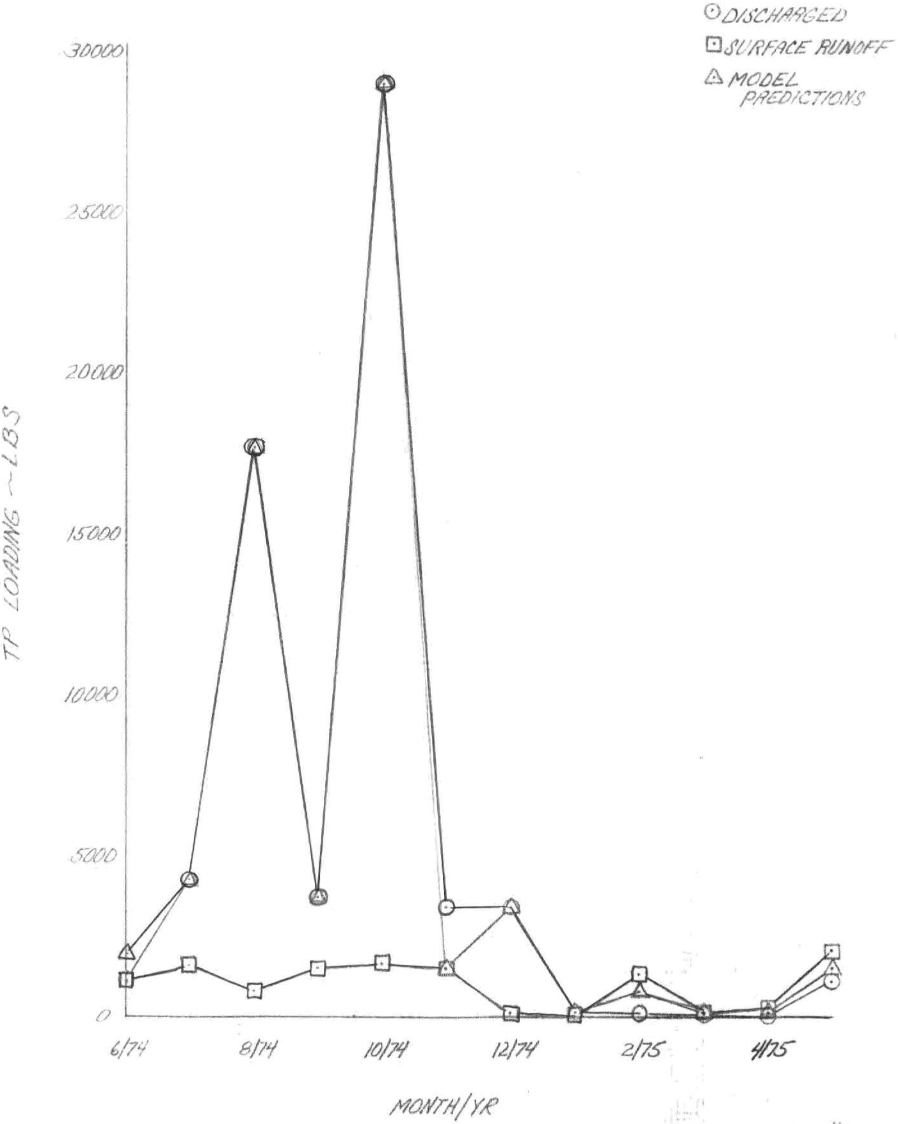


Table 24. Hillsboro + C-14 Basin Quantities and Quality Data Base Period

| Date | Discharge | DATA BASE | | | | MODELED | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Nitrogen | | Total Phosphorus | | Total Nitrogen | | Total Phosphorus | |
| | (Ac-Ft.) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) | Loading (lbs) | Conc. (mg/l) |
| June 1974 | 11566 | 42436 | 1.35 | 1100 | 0.035 | 42505 | 1.35 | 1942 | 0.062 |
| July | 22806 | 139456 | 2.25 | 4277 | 0.069 | 139518 | 2.25 | 4263 | 0.069 |
| August | 26075 | 151653 | 2.14 | 17716 | 0.250 | 151602 | 2.14 | 17717 | 0.250 |
| September | 11103 | 42246 | 1.40 | 3742 | 0.124 | 42230 | 1.40 | 3740 | 0.124 |
| October | 42500 | 168634 | 1.46 | 28992 | 0.251 | 168821 | 1.46 | 29005 | 0.251 |
| November | 11480 | 33384 | 1.07 | 3401 | 0.109 | 26064 | 0.84 | 1535 | 0.049 |
| December | 6742 | 24736 | 1.35 | 3408 | 0.186 | 24662 | 1.35 | 3404 | 0.186 |
| January 1975 | 1177 | 4190 | 1.31 | 179 | 0.056 | 4197 | 1.31 | 178 | 0.056 |
| February | 823 | 2908 | 1.30 | 94 | 0.042 | 8394 | 3.75 | 799 | 0.357 |
| March | 240 | 737 | 1.13 | 27 | 0.042 | 1753 | 2.69 | 167 | 0.257 |
| April | 40 | 151 | 1.39 | 3 | 0.028 | 1711 | 15.74 | 179 | 1.648 |
| May | 8438 | 42425 | 1.85 | 1101 | 0.048 | 23816 | 1.04 | 1554 | 0.068 |
| Total (Avg.) | 142990 | 652956 | (1.68) | 64040 | (0.165) | 635273 | (1.63) | 64483 | (0.166) |

2) All quality predictions are based on the data base period from 6/74 to 5/75.

3) The CLAD model is used to predict plan scenario water quantity and nutrient quality, and 1973-74 land use nutrient quality for the rainfall/discharge record of 1/63 to 12/74.

4) Nonpoint source pollution is ill defined. The nutrient pollutant accumulation rates are halved in the data calibration from those previously used in the west C-51 basin.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSIONS

1. The CLAD model estimates the quantity and quality of water discharged from a basin for some projected land use on a monthly basis.

2. Both quantity and quality computations of the model are based on mass balance principles with the levels of details being consistent with input data accuracy and the desired output.

3. Land use cover analysis, projected land uses, hourly rainfall, historical discharge reocrds, land use pollutant accumulation rates and general basin description parameters are the major input requirements of the model.

4. Discharge predictions do not consider increased water demands within the basin because such aspects are separately handled by a contemporary optimization model.

5. The model predicts water quality using at least one year of historical data (monthly or more frequent) coupled with the STORM model of the Corps of Engineers.

6. Nonpoint sources of pollution other than surface runoff are ill defined, making future quality projections difficult. The CLAD model assumes constant monthly concentrations of other nonpoint sources and sinks from year to year.

7. No mixing effects are presently considered in the model. Although stored stream or canal waters can have a significant effect on water quality during periods of low rainfall and low discharge conditions, these periods are of minimum concern in the backpumping analyses for which the model is primarily developed.

8. Point sources are considered but they are external to the model.

9. In a natural stream as opposed to canal drainage (as in our case), the variability and extent of the sink term should be assessed with additional program calibrations and/or modifications.

10. This model cannot be used to estimate peak discharges or peak pollutant concentrations. The model outputs are average monthly pollutant concentrations and discharges.

11. Future surface runoff abatement schemes for urban land uses can be simulated using the overall treatment efficiency estimations.

RECOMMENDATIONS

1. Stream or canal mixing effects should be incorporated in the CLAD model to make quality predictions of the dry season more accurate.

2. The model should be updated with more knowledge concerning other nonpoint sources and sinks with a better definition of the groundwater balance.

3. While applying the CLAD model to a natural watershed as opposed to canal drainage, several model verification and modification procedures may be necessary.

4. The CLAD model should be updated with the latest version of the STORM model so that land use loading rates in lbs/acre/day can be directly used and the SCS method of calculating runoff can be incorporated.

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EXHIBIT 7.1: Input Set for Western C-51

```
 AAAAAAAAAA   JJJJJJJJJJJ  YY         YY   QQQQQQQQQQ    FFFFFFFFFFFF   GGGGGGGGGG   DDDDDDDDDD
AAAAAAAAAAAA  JJJJJJJJJJJ  YY         YY  QQQQQQQQQQQQ   FFFFFFFFFFFF  GGGGGGGGGGGG  DDDDDDDDDDD
AA        AA          JJ   YY         YY  QQ        QQ   FF            GG         G  DD        DD
AA        AA          JJ   YY         YY  QQ        QQ   FF            GG            DD        DD
AA        AA          JJ   YY         YY  QQ        QQ   FF            GG            DD        DD
AA        AA          JJ   YY         YY  QQ        QQ   FF            GG            DD        DD
AA        AA          JJ   YYY       YYY  QQ        QQ   FF            GG            DD        DD
AA        AA          JJ    YYY     YYY   QQ        QQ   FFFFFFFF      GG            DD        DD
AAAAAAAAAAAA          JJ     YYY   YYY    QQ        QQ   FFFFFFFF      GG      GGGG  DD        DD
AAAAAAAAAAAA          JJ       YYYY       QQ        QQ   FF            GG      GGGG  DD        DD
AA        AA          JJ        YY        QQ        QQ   FF            GG        GG  DD        DD
AA        AA          JJ        YY        QQ    QQ  QQ   FF            GG        GG  DD        DD
AA        AA          JJ        YY        QQ     QQ QQ   FF            GG        GG  DD        DD
AA        AA          JJ        YY        QQ     QQ QQ   FF            GG        GG  DD        DD
AA        AA  JJ      JJ        YY        QQ      QQQQ   FF            GG        GG  DD        DD
AA        AA  JJJJJJJJ          YY        QQQQQQQQQQQQ   FF            GGGGGGGGGGGG  DDDDDDDDDDD
AA        AA   JJJJJ            YY         QQQQQQQQQQ    FF             GGGGGGGGGG   DDDDDDDDDD
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77/02/16. 17.08.09.

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MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW
WMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWM
MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW
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```

```
A1                                  WEST C-51
A2        JAY G FOY  CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3                                WESTERN REACH
B1      1       0       1       0       1       1
#1      1       0       1       0       1       1
B2     10       1          621225       4
C1 LOXAHATCHEE STATION USDOC           11       0  630101  750531       1
E1 C51WEST                5     15. .000001
E218373.       .2      .9      1.       0
E3     .1    .104    .048    .078    .169    .182    .213    .216    .219    .200
E3   .156    .129    .082
F1SINGLE    20.39    21.2    100. 9999999
F2    10. .000001 .000001    .446   .0562   .0117
F1MULTPL      .15     80.    100. 9999999
F2    10. .000001 .000001   1.055   .2341   .0383
F1COMMCL      1.3     85.    100. 9999999
F2    10. .000001 .000001   4.478   .3122   .1066
F1INDSTL      .12    61.1    100. 9999999
F2    10. .000001 .000001   1.758   .4948   .0689
F1OPEN      78.04      5.    100. 9999999
```

Figure 11

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H156477.    [illegible]   1.                                                        .46
H2  .294    [illegible]  .048     .078     .169     .182     .213     .216     .219     .200
H2  .156     .129       .082
J1 2.705    .2705      .0213    .0206  .000825
T1     0
T2   0.0                                3
T3.00001
#3.00001

A1                           WEST C-51 PLAN SCENARIO
A2         JAY G FOY  CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3            SCENARIO LAND USE-             ,                  ,  BOD,N,P
B1       1        0        1        0        1        1
B2      10        1            621225        4
C1 LOXAHATCHEE STATION USDOC               11        0   630101   750531        1
E1 C51WEST                 2       15.  .000001
E252518.          .2     .532       1.        0
E3     .1      .104     .048     .078     .169     .182     .213     .216     .219     .200
E3   .156      .129     .082
F1SINGLE     98.46       20.     100.     9999
F2    10.  .000001  .000001     .446    .0562    .0117
F1OPEN        1.54        5.     100.     9999
F2    10.  .000001  .000001     .122    .0758   .00244
H122333.       .23        1.                                                        .46
H2   .162      .104     .048     .078     .169     .182     .213     .216     .219     .200
H2   .156      .129     .082
J1 6.467     .6467   .03383   .04137  .001703
T1     0
T2   0.0                                3
T3.00001

A1                      WEST C-51 PLAN SCENARIO URBAN
A2         JAY G FOY  CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3            SCENARIO LAND USE-URBAN    ,                  ,  BOD,N,P
#3            SCENARIO LAND USE-URBAN    ,                  ,  BOD,N,P
B1       1        0        1        0        1        1
B2      10        1            621225        4
C1 LOXAHATCHEE STATION USDOC               11        0   630101   750531        1
E1 C51WEST                 2       15.  .000001
E252518.          .2     .532       1.        0
E3     .1      .104     .048     .078     .169     .182     .213     .216     .219     .200
E3   .156      .129     .082
F1SINGLE     98.46       20.     100.     9999
F2    10.  .000001  .000001     .446    .0562    .0117
F1OPEN        1.54        5.     100.     9999
F2    10.  .000001  .000001     .122    .0758   .00244
H1.00001       .23        1.                                                        .46
H2   .162      .104     .048     .078     .169     .182     .213     .216     .219     .200
H2   .156      .129     .082
J1 6.467     .6467   .03383   .04137  .001703
T1     0
T2   0.0                                3
T3.00001

C51WEST            50.        21.        38.        79.        88.       100.       105.
C51WEST           106.        94.        75.        60.        40.          SWETH
C51WEST           692.       291.       516.      1088.      1208.      1369.      1437.
C51WEST          1455.      1287.      1035.       831.       544.          SWETF
   .116
C51WEST 63       3469.      7053.      6109.       547.     12599.      7309.      2999.
#51WEST 63       3469.      7053.      6109.       547.     12599.      7309.      2999.
C51WEST 63       5496.     25718.     25525.     10034.      8864.          DISH
C51WEST 64      13855.     11411.      4350.      4709.      9840.     19456.     11627.
C51WEST 64      12873.     23389.     22947.     19190.     11230.          DISH
C51WEST 65       4292.      4746.         0          0          0      11960.     32319.
C51WEST 65      19630.     11014.     55057.     42722.      6014.          DISH
```

```
C51WEST 66   [illegible]6131.   17903.   24232.    6577.    3582.          DISH
C51WEST 67   [illegible]4360.    5387.    1476.       0     169.   16225.   20432.
C51WEST 67    10524.   14162.   40056.   11770.    5820.          DISH
C51WEST 68     1708.    3820.    4798.      75.   20828.   90365.   51749.
C51WEST 68    22969.   23625.   44430.   14162.    2239.          DISH
C51WEST 69     7900.    3342.   12902.    4661.   15539.   31234.   18067.
C51WEST 69    22340.   24801.   42046.   33338.   15812.          DISH
C51WEST 70    11480.   15425.   45546.   16330.    7077.   27826.   20949.
C51WEST 70    17687.   14505.   17179.    2053.     194.          DISH
C51WEST 70    17687.   14505.   17179.    2053.     194.          DISH
C51WEST 71      670.     272.       0      26.    3130.   11232.   15300.
C51WEST 71    11845.   19620.    9503.   33767.   10161.          DISH
C51WEST 72     9098.    6619.    2747.   12081.   43137.   57354.   21967.
C51WEST 72    18664.   12266.    6657.   10449.    5897.          DISH
C51WEST 73     4181.    2908.    2410.    1303.    4026.   16733.   40992.
C51WEST 73    29603.   41619.   29849.    9366.    9146.          DISH
C51WEST 74    28415.    5349.    1954.      52.      26.   11466.   22746.
C51WEST 74    27868.   21697.   26051.   11677.   13127.          DISH
C51WEST 75     3695.     956.     450.       0.    4407.       0.       0.
C51WEST 75        0.       0.       0.       0.       0.          DISH

C51WEST
C51WEST
C51WEST
C51WEST
C51WEST          .52      .72      .40      .40     1.21    11.12     3.66
C51WEST         1.91     1.52     1.77      .41     2.69          ONPSCN
C51WEST         .148     .040     .040     .040     .040     .121     .256
C51WEST         .080     .074     .121     .150     .108          ONPSCP
C51WEST          0.0      0.0     .247     .247                   REFF

          AJYQFGD.    77/02/15.FLORIDA STATE UNIVERSITY KRONOS
          AJYQFGD.    77/02/15.FLORIDA STATE UNIVERSITY KRONOS

17.03.04.JGF,T550,CM120000,MO.   FOY
17.03.07.ACCOUNT,
17.03.08.STAGEI,RI1098,7782/TAPE11.
17.04.13.MT51, ASSIGNED TO STAGEIN, VSN=****51.
17.04.22. STAGING COMPLETE.
17.04.22.CBR,,CARDS.
17.04.22. COPY COMPLETE.
17.04.23.CBR,,CARD2.
17.04.23. COPY COMPLETE.
17.04.23.CBR,,IP1.
17.04.23. COPY COMPLETE.
17.04.23.CBR,,IP2.
17.04.23. COPY COMPLETE.
17.04.23.CBR,,IP3.
17.04.23. COPY COMPLETE.
17.04.24.G,STORM,SUMMB.
17.04.46.CALL (PROG2(LFN=LAND,NAME=IP1)
17.04.49.RA,INPUT.
17.04.50.ASSIGN,MS,OUTPUT.
17.04.50.DI00, ASSIGNED TO OUTPUT.
17.16.24.STORM(IP1)
19.03.45.STOP
19.03.45.RENAME,QUAL=TAPE13.
19.03.45.RENAME,OUT=OUTPUT.
19.03.45.RA,INPUT.
19.16.03.SUMMB.
19.18.39.STOP
19.18.39.RENAME,LAND=QUALSUM.
```

EXHIBIT 7.2: CLADM Hydrologic Output for Western C-51 Using 1973-74 Land Uses and Planned Scenario

Note: SWET, DSET, NGWL are defined in the Report and these notations are also used in subsequent Exhibits No. 7.7 and 7.11

WEST C-51 BASIN

| | | 73-74 LAND USES | | | | | | SCENARIO LAND USES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RAINFALL | DISCHARGE | RUNOFF | SWET | DSET | NGWL | NGWL | RUNOFF | DSET | SWET | DISCHARGE |
| 63 | 1 | 4678 | 3469 | 187 | 50 | 3895 | -2736 | -3053 | 437 | 2966 | 692 | 4073 |
| #3 | 1 | 4678 | 3469 | 187 | 50 | 3895 | -2736 | -3053 | 437 | 2966 | 692 | 4073 |
| 63 | 2 | 19024 | 7053 | 3056 | 21 | 6236 | 5714 | 5120 | 3930 | 3614 | 291 | 9999 |
| 63 | 3 | 12662 | 6109 | 1934 | 38 | 4572 | 1943 | 1741 | 2433 | 3122 | 516 | 7283 |
| 63 | 4 | 0 | 547 | 0 | 79 | 0 | -626 | -699 | 0 | 0 | 1088 | 0 |
| 63 | 5 | 44099 | 12599 | 8109 | 88 | 10171 | 21241 | 19033 | 9544 | 6674 | 1208 | 16794 |
| 63 | 6 | 30813 | 7309 | 4553 | 100 | 11761 | 11643 | 10433 | 5801 | 8065 | 1369 | 10946 |
| 63 | 7 | 16280 | 2999 | 2121 | 105 | 7406 | 5770 | 5170 | 2807 | 5273 | 1437 | 4400 |
| 63 | 8 | 36240 | 5496 | 5302 | 106 | 14056 | 16582 | 14858 | 6986 | 8844 | 1455 | 11083 |
| 63 | 9 | 52832 | 25718 | 9543 | 94 | 12901 | 14119 | 12651 | 11103 | 9291 | 1287 | 29603 |
| 63 | 10 | 14221 | 25525 | 1435 | 75 | 8219 | -19598 | -21871 | 2058 | 6149 | 1035 | 28908 |
| 63 | 11 | 10354 | 10034 | 1185 | 60 | 5396 | -5136 | -5732 | 1622 | 3994 | 831 | 11261 |
| 63 | 12 | 42290 | 8864 | 9231 | 40 | 3665 | 29721 | 26632 | 10292 | 1930 | 544 | 13184 |
| | | 283493 | 115722 | 46656 | 856 | 88278 | 78637 | 64284 | 57013 | 59922 | 11753 | 147534 |
| # | | 283493 | 115722 | 46656 | 856 | 88278 | 78637 | 64284 | 57013 | 59922 | 11753 | 147534 |
| 64 | 1 | 11976 | 13855 | 1310 | 50 | 6495 | -8424 | -9401 | 1934 | 4393 | 692 | 16292 |
| 64 | 2 | 23079 | 11411 | 4366 | 21 | 4810 | 6837 | 6126 | 5052 | 3265 | 291 | 13397 |
| 64 | 3 | 19149 | 4350 | 3306 | 38 | 5317 | 9444 | 8462 | 4054 | 3250 | 516 | 6921 |
| 64 | 4 | 34493 | 4709 | 6050 | 79 | 9178 | 20527 | 18393 | 7360 | 5630 | 1088 | 9382 |
| 64 | 5 | 14346 | 9840 | 2183 | 88 | 5212 | -794 | -886 | 2745 | 3584 | 1208 | 10440 |
| 64 | 6 | 72355 | 19456 | 14533 | 100 | 11546 | 41253 | 36965 | 16218 | 8757 | 1369 | 25264 |
| 64 | 7 | 21831 | 11627 | 2058 | 105 | 13219 | -3120 | -3482 | 3306 | 8867 | 1437 | 15009 |
| 64 | 8 | 59319 | 12873 | 11103 | 106 | 12863 | 33477 | 29997 | 12912 | 8685 | 1455 | 19182 |
| 64 | 9 | 22018 | 23389 | 2121 | 94 | 13145 | -14610 | -16305 | 3244 | 9299 | 1287 | 27737 |
| 64 | 10 | 62001 | 22947 | 13036 | 75 | 7455 | 31524 | 28247 | 14534 | 5007 | 1035 | 27712 |
| 64 | 11 | 14097 | 19190 | 2245 | 60 | 4701 | -9854 | -10997 | 2682 | 3579 | 831 | 20684 |
| 64 | 12 | 13847 | 11230 | 1871 | 40 | 6018 | -3441 | -3840 | 2682 | 3329 | 544 | 13814 |
| #4 | 12 | 13847 | 11230 | 1871 | 40 | 6018 | -3441 | -3840 | 2682 | 3329 | 544 | 13814 |
| | | 368511 | 164877 | 64182 | 856 | 99959 | 102819 | 83281 | 76723 | 67645 | 11753 | 205832 |
| 65 | 1 | 2308 | 4292 | 62 | 50 | 2047 | -4081 | -4554 | 250 | 1329 | 692 | 4841 |
| 65 | 2 | 20958 | 4746 | 3805 | 21 | 5038 | 11153 | 9994 | 4242 | 4325 | 291 | 6348 |
| 65 | 3 | 6674 | 0 | 437 | 38 | 4847 | 1789 | 1603 | 998 | 2760 | 516 | 1795 |
| 65 | 4 | 15906 | 0 | 2932 | 79 | 3639 | 12188 | 10921 | 3555 | 1963 | 1088 | 1934 |
| 65 | 5 | 6736 | 0 | 811 | 88 | 3344 | 3304 | 2961 | 1123 | 2334 | 1208 | 233 |
| 65 | 6 | 84955 | 11960 | 17215 | 100 | 12923 | 59972 | 53738 | 19461 | 8637 | 1369 | 21211 |
| 65 | 7 | 69299 | 32319 | 12413 | 105 | 17363 | 19512 | 17484 | 14409 | 12794 | 1437 | 37584 |
| 65 | 8 | 20272 | 19630 | 2495 | 106 | 9832 | -9296 | -10374 | 3618 | 6085 | 1455 | 23106 |
| 65 | 9 | 35741 | 11014 | 4928 | 94 | 15123 | 9510 | 8522 | 6300 | 11036 | 1287 | 14896 |
| 65 | 10 | 86327 | 55057 | 18650 | 75 | 8293 | 22902 | 20522 | 20646 | 5362 | 1035 | 59408 |
| 65 | 11 | 2370 | 42722 | 374 | 60 | 804 | -41216 | -45997 | 437 | 658 | 831 | 46878 |
| #5 | 11 | 2370 | 42722 | 374 | 60 | 804 | -41216 | -45997 | 437 | 658 | 831 | 46878 |
| 65 | 12 | 8171 | 6014 | 998 | 40 | 3995 | -1878 | -2096 | 1497 | 2301 | 544 | 7422 |
| | | 359717 | 187754 | 65120 | 856 | 87248 | 83859 | 62722 | 76536 | 59584 | 11753 | 225658 |
| 66 | 1 | 40606 | 18109 | 7485 | 50 | 9288 | 13159 | 11791 | 8982 | 5383 | 692 | 22740 |
| 66 | 2 | 28755 | 20071 | 5988 | 21 | 3700 | 4963 | 4447 | 6612 | 2826 | 291 | 21191 |
| 66 | 3 | 7797 | 11867 | 312 | 38 | 6492 | -10600 | -11830 | 936 | 4128 | 516 | 14983 |
| 66 | 4 | 36115 | 4810 | 7298 | 79 | 5580 | 25646 | 22980 | 8358 | 3338 | 1088 | 8709 |
| 66 | 5 | 39421 | 10020 | 6799 | 88 | 10974 | 18339 | 16433 | 8046 | 7867 | 1208 | 13913 |
| 66 | 6 | 91691 | 36434 | 17964 | 100 | 16528 | 38629 | 34614 | 20646 | 10726 | 1369 | 44982 |
| 66 | 7 | 37113 | 44618 | 5614 | 105 | 13625 | -21235 | -23698 | 7236 | 8739 | 1437 | 50635 |
| 66 | 8 | 73353 | 36131 | 13972 | 106 | 14892 | 22224 | 19914 | 15968 | 10733 | 1455 | 41251 |
| 66 | 9 | 54640 | 17903 | 9231 | 94 | 16015 | 20628 | 18484 | 10978 | 11590 | 1287 | 23279 |
| #6 | 9 | 54640 | 17903 | 9231 | 94 | 16015 | 20628 | 18484 | 10978 | 11590 | 1287 | 23279 |
| 66 | 10 | 27320 | 24232 | 4241 | 75 | 9573 | -6560 | -7321 | 5302 | 6529 | 1035 | 27077 |
| 66 | 11 | 6425 | 6577 | 249 | 60 | 5381 | -5593 | -6242 | 686 | 3734 | 831 | 8102 |
| 66 | 12 | 10916 | 3582 | 1060 | 40 | 6479 | 815 | 730 | 1622 | 4556 | 544 | 5086 |
| | | 454152 | 234354 | 80213 | 856 | 118527 | 100415 | 80303 | 95372 | 80149 | 11753 | 281947 |
| 67 | 1 | 5489 | 4360 | 374 | 50 | 3923 | -2844 | -3174 | 561 | 3288 | 692 | 4683 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67 | 3 | 49[illegible] | 1476 | 1499 | 38 | 2902 | 574 | 514 | 873 | 1566 | 516 | 2394 |
| 67 | 4 | | 0 | 0 | 79 | 0 | -79 | -88 | 0 | 0 | 1088 | 0 |
| 67 | 5 | 3493 | 169 | 62 | 88 | 3232 | 4 | 4 | 187 | 2759 | 1208 | 0 |
| 67 | 6 | 72105 | 16225 | 12163 | 100 | 21213 | 34567 | 30974 | 14721 | 14378 | 1369 | 23907 |
| 67 | 7 | 69423 | 20432 | 13972 | 105 | 10963 | 37923 | 33981 | 15656 | 8027 | 1437 | 25978 |
| 67 | 8 | 23328 | 10524 | 3181 | 106 | 10018 | 2680 | 2401 | 4304 | 6450 | 1455 | 13022 |
| 67 | 8 | 23328 | 10524 | 3181 | 106 | 10018 | 2680 | 2401 | 4304 | 6450 | 1455 | 13022 |
| 67 | 9 | 45658 | 14162 | 8109 | 94 | 11730 | 19672 | 17627 | 9606 | 7989 | 1287 | 18755 |
| 67 | 10 | 34181 | 40056 | 5239 | 75 | 12259 | -18209 | -20321 | 6737 | 7764 | 1035 | 45703 |
| 67 | 11 | 4366 | 11770 | 561 | 60 | 2017 | -9481 | -10581 | 749 | 1431 | 831 | 12685 |
| 67 | 12 | 13847 | 5820 | 2308 | 40 | 4191 | 3796 | 3401 | 2932 | 2351 | 544 | 7551 |
| | | 301331 | 130381 | 51333 | 856 | 86542 | 83552 | 68134 | 62002 | 58195 | 11753 | 163249 |
| 68 | 1 | 4429 | 1708 | 624 | 50 | 1819 | 852 | 763 | 811 | 1249 | 692 | 1725 |
| 68 | 2 | 19773 | 3820 | 3368 | 21 | 5680 | 10252 | 9186 | 4179 | 3384 | 291 | 6912 |
| 68 | 3 | 20833 | 4798 | 4117 | 38 | 3608 | 12389 | 11101 | 4741 | 2243 | 516 | 6973 |
| 68 | 4 | 4366 | 75 | 125 | 79 | 3844 | 368 | 330 | 437 | 2654 | 1088 | 294 |
| 68 | 5 | 53081 | 20828 | 9044 | 88 | 15238 | 16927 | 15168 | 10916 | 10275 | 1208 | 26430 |
| 68 | 6 | 127183 | 90365 | 26821 | 100 | 14959 | 21759 | 19497 | 29629 | 10994 | 1369 | 95323 |
| 68 | 7 | 59693 | 51749 | 11165 | 105 | 12977 | -5138 | -5734 | 13037 | 8570 | 1437 | 55420 |
| 68 | 7 | 59693 | 51749 | 11165 | 105 | 12977 | -5138 | -5734 | 13037 | 8570 | 1437 | 55420 |
| 68 | 8 | 30938 | 22969 | 4553 | 106 | 11886 | -4023 | -4490 | 5863 | 7945 | 1455 | 26028 |
| 68 | 9 | 29379 | 23625 | 3867 | 94 | 13198 | -7538 | -8412 | 5240 | 8832 | 1287 | 27672 |
| 68 | 10 | 32622 | 44430 | 5926 | 75 | 7829 | -19712 | -21999 | 6737 | 6204 | 1035 | 47382 |
| 68 | 11 | 18213 | 14162 | 3555 | 60 | 3337 | 654 | 586 | 4117 | 2069 | 831 | 14727 |
| 68 | 12 | 0 | 2239 | 0 | 40 | 0 | -2279 | -2543 | 0 | 0 | 544 | 1999 |
| | | 400510 | 280768 | 73165 | 856 | 94375 | 24511 | 13454 | 85707 | 64419 | 11753 | 310884 |
| 69 | 1 | 11976 | 7900 | 1996 | 50 | 3624 | 402 | 360 | 2370 | 2681 | 692 | 8243 |
| 69 | 2 | 11539 | 3342 | 2058 | 21 | 2927 | 5249 | 4703 | 2495 | 1755 | 291 | 4790 |
| 69 | 3 | 28880 | 12902 | 5177 | 38 | 7218 | 8722 | 7815 | 6300 | 4174 | 516 | 16375 |
| 69 | 4 | 8233 | 4661 | 1123 | 79 | 3536 | -43 | -48 | 1497 | 2363 | 1088 | 4830 |
| 69 | 5 | 43912 | 15539 | 7423 | 88 | 12855 | 15430 | 13826 | 8857 | 9178 | 1208 | 19700 |
| 69 | 6 | 107035 | 31234 | 21519 | 100 | 16996 | 58705 | 52603 | 24264 | 11883 | 1369 | 41180 |
| 69 | 6 | 107035 | 31234 | 21519 | 100 | 16996 | 58705 | 52603 | 24264 | 11883 | 1369 | 41180 |
| 69 | 7 | 27507 | 18067 | 3867 | 105 | 11326 | -1991 | -2222 | 4990 | 7939 | 1437 | 20353 |
| 69 | 8 | 32872 | 22340 | 4054 | 106 | 15908 | -5482 | -6118 | 5676 | 10612 | 1455 | 26923 |
| 69 | 9 | 51147 | 24801 | 8046 | 94 | 17480 | 8772 | 7860 | 9855 | 12500 | 1287 | 29500 |
| 69 | 10 | 73977 | 42046 | 14284 | 75 | 14211 | 17645 | 15811 | 16031 | 11112 | 1035 | 46019 |
| 69 | 11 | 27570 | 33338 | 5364 | 60 | 5125 | -10953 | -12224 | 6050 | 3843 | 831 | 35120 |
| 69 | 12 | 7984 | 15812 | 1247 | 40 | 2764 | -10632 | -11865 | 1559 | 1869 | 544 | 17436 |
| | | 432632 | 231982 | 76158 | 856 | 113970 | 85824 | 70503 | 89944 | 79909 | 11753 | 270467 |
| 70 | 1 | 14159 | 11480 | 1622 | 50 | 7374 | -4745 | -5295 | 2495 | 4375 | 692 | 14387 |
| 70 | 2 | 15032 | 15425 | 2495 | 21 | 4593 | -5007 | -5588 | 2994 | 3291 | 291 | 17038 |
| 70 | 3 | 85204 | 45546 | 18775 | 38 | 6648 | 32972 | 29545 | 20709 | 3994 | 516 | 51149 |
| 70 | 4 | 4366 | 16330 | 686 | 79 | 1495 | -13538 | -15108 | 936 | 697 | 1088 | 17689 |
| 70 | 4 | 4366 | 16330 | 686 | 79 | 1495 | -13538 | -15108 | 936 | 697 | 1088 | 17689 |
| 70 | 5 | 35117 | 7077 | 6612 | 88 | 7453 | 20499 | 18368 | 7547 | 5520 | 1208 | 10021 |
| 70 | 6 | 55888 | 27826 | 10292 | 100 | 12826 | 15136 | 13563 | 12101 | 8434 | 1369 | 32522 |
| 70 | 7 | 40294 | 20949 | 6050 | 105 | 14979 | 4261 | 3818 | 7859 | 9474 | 1437 | 25565 |
| 70 | 8 | 27320 | 17687 | 3930 | 106 | 10878 | -1351 | -1508 | 4990 | 7752 | 1455 | 19621 |
| 70 | 9 | 46656 | 14505 | 6612 | 94 | 18992 | 13065 | 11707 | 8483 | 13390 | 1287 | 20272 |
| 70 | 10 | 19710 | 17179 | 2557 | 75 | 9010 | -6554 | -7314 | 3493 | 6012 | 1035 | 19977 |
| 70 | 11 | 0 | 2053 | 0 | 60 | 0 | -2113 | -2358 | 0 | 0 | 831 | 1527 |
| 70 | 12 | 4366 | 194 | 249 | 40 | 3322 | 810 | 726 | 561 | 2165 | 544 | 931 |
| | | 348112 | 196251 | 59880 | 856 | 97570 | 53435 | 40555 | 72168 | 65104 | 11753 | 230700 |
| 71 | 1 | 10916 | 670 | 1684 | 50 | 3869 | 6327 | 5669 | 2121 | 2599 | 692 | 1956 |
| 71 | 2 | 5177 | 272 | 374 | 21 | 3611 | 1273 | 1141 | 749 | 2242 | 291 | 1503 |
| 71 | 3 | 2058 | 0 | 62 | 38 | 1797 | 223 | 200 | 250 | 1080 | 516 | 262 |
| 71 | 3 | 2058 | 0 | 62 | 38 | 1797 | 223 | 200 | 250 | 1080 | 516 | 262 |
| 71 | 4 | 10292 | 26 | 1372 | 79 | 4550 | 5637 | 5051 | 2058 | 2220 | 1088 | 1933 |
| 71 | 5 | 28131 | 3130 | 5302 | 88 | 5947 | 18966 | 16995 | 6238 | 3670 | 1208 | 6258 |
| 71 | 6 | 51459 | 11232 | 8608 | 100 | 15443 | 24684 | 22118 | 10853 | 8898 | 1369 | 19074 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 71 8 | 2856[illegible] | 11845 | 3742 | 106 | 12909 | 3708 | 3323 | 5302 | 7776 | 1455 | 16014 |
| 71 9 | 3798[illegible] | 19620 | 5926 | 94 | 13193 | 5079 | 4551 | 7485 | 8633 | 1287 | 23515 |
| 71 10 | 37113 | 9503 | 5738 | 75 | 13103 | 14432 | 12932 | 7360 | 8249 | 1035 | 14897 |
| 71 11 | 53642 | 33767 | 11539 | 60 | 5360 | 14455 | 12953 | 12538 | 4476 | 831 | 35382 |
| 71 12 | 18089 | 10161 | 3493 | 40 | 3474 | 4414 | 3955 | 4054 | 2189 | 544 | 11401 |
| | 323538 | 115526 | 53516 | 856 | 99614 | 107542 | 96364 | 66618 | 62297 | 11753 | 153124 |
| 72 1 | 12537 | 9098 | 1185 | 50 | 7579 | -4190 | -4676 | 2183 | 3976 | 692 | 12545 |
| 72 2 | 8296 | 6619 | 686 | 21 | 5425 | -3769 | -4206 | 1248 | 3404 | 291 | 8807 |
| ▮2 2 | 8296 | 6619 | 686 | 21 | 5425 | -3769 | -4206 | 1248 | 3404 | 291 | 8807 |
| 72 3 | 25574 | 2747 | 5239 | 38 | 3651 | 19138 | 17149 | 6238 | 1113 | 516 | 6796 |
| 72 4 | 58757 | 12081 | 11477 | 79 | 10736 | 35861 | 32134 | 13037 | 7634 | 1088 | 17901 |
| 72 5 | 61003 | 43137 | 10354 | 88 | 17679 | 99 | 89 | 12538 | 11837 | 1208 | 47869 |
| 72 6 | 77532 | 57354 | 14409 | 100 | 17245 | 2833 | 2539 | 16654 | 12222 | 1369 | 61402 |
| 72 7 | 37051 | 21967 | 5676 | 105 | 13301 | 1678 | 1504 | 6986 | 9655 | 1437 | 24455 |
| 72 8 | 22143 | 18664 | 1684 | 106 | 15097 | -11724 | -13084 | 3181 | 9668 | 1455 | 24104 |
| 72 9 | 9231 | 12266 | 811 | 94 | 5839 | -8968 | -10008 | 1372 | 3850 | 1287 | 14102 |
| 72 10 | 13348 | 6657 | 1746 | 75 | 6041 | 575 | 515 | 2370 | 4053 | 1035 | 7745 |
| 72 11 | 7485 | 10449 | 686 | 60 | 4614 | -7638 | -8524 | 1060 | 3327 | 831 | 11851 |
| 72 12 | 11539 | 5897 | 1559 | 40 | 5015 | 587 | 526 | 2058 | 3467 | 544 | 7002 |
| | 344496 | 206936 | 55512 | 856 | 112222 | 24482 | 13956 | 68925 | 74206 | 11753 | 244581 |
| 73 1 | 31437 | 4181 | 5801 | 50 | 7165 | 20041 | 17958 | 6737 | 5019 | 692 | 7768 |
| ▮3 1 | 31437 | 4181 | 5801 | 50 | 7165 | 20041 | 17958 | 6737 | 5019 | 692 | 7768 |
| 73 2 | 14908 | 2908 | 2245 | 21 | 5512 | 6467 | 5795 | 2745 | 4145 | 291 | 4677 |
| 73 3 | 14159 | 2410 | 2308 | 38 | 4503 | 7208 | 6459 | 2932 | 2663 | 516 | 4521 |
| 73 4 | 4366 | 1303 | 374 | 79 | 2800 | 184 | 165 | 686 | 1676 | 1088 | 1437 |
| 73 5 | 15531 | 4026 | 2433 | 88 | 5353 | 6064 | 5434 | 2932 | 4035 | 1208 | 4854 |
| 73 6 | 47530 | 16733 | 8608 | 100 | 11514 | 19183 | 17189 | 10230 | 7414 | 1369 | 21558 |
| 73 7 | 64683 | 40992 | 11851 | 105 | 15096 | 8490 | 7608 | 13972 | 9891 | 1437 | 45747 |
| 73 8 | 52457 | 29603 | 7734 | 106 | 20095 | 2653 | 2377 | 9980 | 13320 | 1455 | 35305 |
| 73 9 | 47343 | 41619 | 7797 | 94 | 14720 | -9090 | -10144 | 9606 | 9673 | 1287 | 46527 |
| 73 10 | 26322 | 29849 | 3555 | 75 | 11446 | -15048 | -16794 | 4741 | 7732 | 1035 | 34349 |
| 73 11 | 10167 | 9366 | 1622 | 60 | 3382 | -2641 | -2947 | 1996 | 2340 | 831 | 9943 |
| 73 12 | 19648 | 9146 | 3368 | 40 | 5555 | 4907 | 4397 | 4179 | 3259 | 544 | 11448 |
| | 348551 | 192136 | 57696 | 856 | 107141 | 48418 | 37495 | 70736 | 71167 | 11753 | 228136 |
| ▮ | 348551 | 192136 | 57696 | 856 | 107141 | 48418 | 37495 | 70736 | 71167 | 11753 | 228136 |
| 74 1 | 34868 | 28415 | 7235 | 50 | 4593 | 1810 | 1622 | 8109 | 3069 | 692 | 29485 |
| 74 2 | 3056 | 5349 | 125 | 21 | 2534 | -4848 | -5410 | 250 | 2078 | 291 | 6097 |
| 74 3 | 11103 | 1954 | 2245 | 38 | 1707 | 7404 | 6634 | 2620 | 829 | 516 | 3124 |
| 74 4 | 6487 | 52 | 811 | 79 | 3094 | 3262 | 2923 | 1185 | 1839 | 1088 | 637 |
| 74 5 | 16467 | 26 | 2121 | 88 | 7594 | 8759 | 7849 | 2807 | 5460 | 1208 | 1950 |
| 74 6 | 44598 | 11466 | 7485 | 100 | 13280 | 19752 | 17699 | 9169 | 8641 | 1369 | 16889 |
| 74 7 | 73727 | 22746 | 13161 | 105 | 18659 | 32217 | 28868 | 15656 | 12331 | 1437 | 31091 |
| 74 8 | 26696 | 27868 | 3493 | 106 | 12081 | -13359 | -14909 | 4741 | 8106 | 1455 | 32044 |
| 74 9 | 42353 | 21697 | 6487 | 94 | 15210 | 5352 | 4796 | 8421 | 9331 | 1287 | 26939 |
| 74 10 | 18401 | 26051 | 3493 | 75 | 3785 | -11510 | -12845 | 4117 | 2256 | 1035 | 27955 |
| 74 11 | 26010 | 11677 | 4429 | 60 | 7480 | 6793 | 6087 | 5177 | 5708 | 831 | 13384 |
| 74 12 | 11976 | 13127 | 2121 | 40 | 3103 | -4294 | -4792 | 2433 | 2436 | 544 | 13788 |
| ▮4 12 | 11976 | 13127 | 2121 | 40 | 3103 | -4294 | -4792 | 2433 | 2436 | 544 | 13788 |
| | 315742 | 170428 | 53206 | 856 | 93120 | 51338 | 38521 | 64685 | 62084 | 11753 | 203384 |
| 75 1 | 1372 | 3695 | 0 | 50 | 1372 | -3745 | -4179 | 62 | 1128 | 692 | 3731 |
| 75 2 | 1622 | 956 | 0 | 21 | 1622 | -977 | -1090 | 62 | 1377 | 291 | 1044 |
| 75 3 | 4429 | 450 | 374 | 38 | 2863 | 1078 | 966 | 624 | 1983 | 516 | 964 |
| 75 4 | 4553 | 0 | 125 | 79 | 4031 | 443 | 397 | 437 | 2841 | 1088 | 227 |
| 75 5 | 25761 | 4407 | 3056 | 88 | 12973 | 8293 | 7431 | 4179 | 9372 | 1208 | 7750 |
| 75 6 | 0 | 0 | 0 | 100 | 0 | -100 | -112 | 0 | 0 | 1369 | 0 |
| 75 7 | 0 | 0 | 0 | 105 | 0 | -105 | -117 | 0 | 0 | 1437 | 0 |
| 75 8 | 0 | 0 | 0 | 106 | 0 | -106 | -118 | 0 | 0 | 1455 | 0 |
| 75 9 | 0 | 0 | 0 | 94 | 0 | -94 | -105 | 0 | 0 | 1287 | 0 |
| 75 10 | 0 | 0 | 0 | 75 | 0 | -75 | -84 | 0 | 0 | 1035 | 0 |
| 75 11 | 0 | 0 | 0 | 60 | 0 | -60 | -67 | 0 | 0 | 831 | 0 |
| 75 12 | 0 | 0 | 0 | 40 | 0 | -40 | -45 | 0 | 0 | 544 | 0 |
| | 37737 | 9508 | 3555 | 856 | 22861 | 4512 | 2877 | 5364 | 16701 | 11753 | 13717 |

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1-22

EXHIBIT 7.3: CLADM Quality Output for Western C-51
Using 1973-74 Land Uses.

TLSS = Total Loading for Suspended Solids.

TLBOD = Total Loading for Biochemical Oxygen Demand (BOD)

TLN = Total Loading for Nitrogen

TLP = Total Loading for Phosphorus

TCSS = Total Concentration for Suspended Solids

TCBOD = Total Concentration for BOD

TCN = Total Concentration for Nitrogen

TCP = Total Concentration for Phosphorus

The same notations are used in subsequent exhibits No. 7.4, 7.8, 7.9, 7.12 and 7.13.

AJYIEQM

77/02/12. 18.37.53.

WEST C-51 BASIN
1973-4 LAND USES

| | | TLSS | TLBOD | TLN | TLP | TCSS | TCBOD | TCN | TCP |
|---|---|---|---|---|---|---|---|---|---|
| 63 | 1 | 0 | 11910 | 8268 | 1599 | 0.00 | 1.26 | .88 | .170 |
| 63 | 2 | 224620 | 17780 | 14412 | 880 | 11.72 | .93 | .75 | .046 |
| 63 | 2 | 224620 | 17780 | 14412 | 880 | 11.72 | .93 | .75 | .046 |
| 63 | 3 | 671616 | 19088 | 13861 | 983 | 40.45 | 1.15 | .83 | .059 |
| 63 | 4 | 0 | 0 | 595 | 59 | 0.00 | 0.00 | .40 | .040 |
| 63 | 5 | 1228313 | 44568 | 39971 | 1801 | 35.87 | 1.30 | 1.17 | .053 |
| 63 | 6 | 1245161 | 21929 | 96469 | 1570 | 62.68 | 1.10 | 4.86 | .079 |
| 63 | 7 | 691422 | 14008 | 16610 | 1023 | 84.83 | 1.72 | 2.04 | .125 |
| 63 | 8 | 1807457 | 31709 | 20100 | 1003 | 121.01 | 2.12 | 1.35 | .067 |
| 63 | 9 | 2984906 | 44517 | 101170 | 4776 | 42.71 | .64 | 1.45 | .068 |
| 63 | 10 | 457516 | 12088 | 121956 | 8260 | 6.60 | .17 | 1.76 | .119 |
| 63 | 11 | 559296 | 16319 | 17751 | 4056 | 20.51 | .60 | .65 | .149 |
| 63 | 12 | 1383549 | 54057 | 38717 | 1780 | 57.43 | 2.24 | 1.61 | .074 |
| | | 11253856 | 287973 | 489881 | 27791 | 35.78 | .92 | 1.56 | .088 |
| 64 | 1 | 437633 | 14649 | 24477 | 5442 | 11.62 | .39 | .65 | .145 |
| 64 | 2 | 495164 | 23467 | 28738 | 1497 | 15.97 | .76 | .93 | .048 |
| 64 | 3 | 1623902 | 26931 | 17814 | 940 | 137.36 | 2.28 | 1.51 | .080 |
| 64 | 4 | 600061 | 29315 | 20184 | 946 | 46.89 | 2.29 | 1.58 | .074 |
| 64 | 4 | 600061 | 29315 | 20184 | 946 | 46.89 | 2.29 | 1.58 | .074 |
| 64 | 5 | 872533 | 17430 | 35045 | 1346 | 32.63 | .65 | 1.31 | .050 |
| 64 | 6 | 3737916 | 51292 | 189124 | 3391 | 70.69 | .97 | 3.58 | .064 |
| 64 | 7 | 497138 | 17125 | 102397 | 7120 | 15.73 | .54 | 3.26 | [illegible] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 64 | 8 | 22[illegible]41 | 47909 | 46033 | 2021 | 64.73 | 1.37 | 1.32 | .058 |
| 64 | 9 | 6[illegible]82 | 19305 | 97384 | 4814 | 10.98 | .30 | 1.53 | .076 |
| 64 | 10 | 905950 | 44448 | 81596 | 4771 | 14.53 | .71 | 1.31 | .077 |
| 64 | 11 | 397967 | 15755 | 25759 | 7326 | 7.63 | .30 | .49 | .140 |
| 64 | 12 | 516646 | 16526 | 76154 | 3196 | 16.93 | .54 | 2.50 | .105 |
| | | 13047733 | 324152 | 745304 | 42811 | 29.12 | .72 | 1.66 | .096 |
| 65 | 1 | 0 | 13334 | 10043 | 2013 | 0.00 | 1.14 | .86 | .173 |
| 65 | 2 | 1327361 | 23220 | 15843 | 806 | 102.91 | 1.80 | 1.23 | .063 |
| 65 | 3 | 0 | 0 | 0 | 0 | I | I | I | I |
| 65 | 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 65 | 5 | 0 | 0 | 0 | 0 | I | I | I | I |
| 65 | 6 | 3158144 | 68409 | 59064 | 2484 | 97.16 | 2.10 | 1.82 | .076 |
| 65 | 7 | 3481984 | 48454 | 236153 | 15526 | 39.64 | .55 | 2.69 | .177 |
| 15 | 7 | 3481984 | 48454 | 236153 | 15526 | 39.64 | .55 | 2.69 | .177 |
| 65 | 8 | 764644 | 18231 | 98492 | 4246 | 14.33 | .34 | 1.85 | .080 |
| 65 | 9 | 1744828 | 27601 | 42653 | 2081 | 58.29 | .92 | 1.42 | .070 |
| 65 | 10 | 1219242 | 46212 | 211226 | 13564 | 8.15 | .31 | 1.41 | .091 |
| 65 | 11 | 57316 | 786 | 47727 | 17289 | .49 | .01 | .41 | .149 |
| 65 | 12 | 167647 | 28557 | 46251 | 2161 | 10.26 | 1.75 | 2.83 | .132 |
| | | 11921166 | 274804 | 767453 | 60171 | 23.36 | .54 | 1.50 | .118 |
| 66 | 1 | 1528019 | 23850 | 30254 | 5017 | 31.05 | .48 | .61 | .102 |
| 66 | 2 | 54048 | 18977 | 38840 | 2103 | .99 | .35 | .71 | .039 |
| 66 | 3 | 20468 | 14324 | 17034 | 1594 | .63 | .44 | .53 | .049 |
| 66 | 4 | 176506 | 15881 | 9199 | 473 | 13.50 | 1.21 | .70 | .036 |
| 66 | 5 | 1354381 | 24134 | 25012 | 1080 | 49.73 | .89 | .92 | .040 |
| 66 | 6 | 2315619 | 38096 | 587100 | 7367 | 23.39 | .38 | 5.93 | .074 |
| 66 | 7 | 1028308 | 21599 | 399923 | 27769 | 8.48 | .18 | 3.30 | .229 |
| 66 | 8 | 2438310 | 31981 | 137491 | 5861 | 24.83 | .33 | 1.40 | .060 |
| 66 | 9 | 1965806 | 23839 | 53346 | 2539 | 40.40 | .49 | 1.10 | .052 |
| 16 | 9 | 1965806 | 23839 | 53346 | 2539 | 40.40 | .49 | 1.10 | .052 |
| 66 | 10 | 818969 | 20438 | 106667 | 7153 | 12.44 | .31 | 1.62 | .109 |
| 66 | 11 | 16788 | 12851 | 11056 | 2884 | .94 | .72 | .62 | .161 |
| 66 | 12 | 204826 | 12107 | 23195 | 1049 | 21.04 | 1.24 | 2.38 | .108 |
| | | 11922048 | 258077 | 1439117 | 64890 | 18.72 | .41 | 2.26 | .102 |
| 67 | 1 | 75733 | 18062 | 11534 | 2036 | 6.39 | 1.52 | .97 | .172 |
| 67 | 2 | 1216442 | 29305 | 21513 | 1011 | 83.09 | 2.00 | 1.47 | .069 |
| 67 | 3 | 193663 | 16942 | 7237 | 526 | 48.28 | 4.22 | 1.80 | .131 |
| 67 | 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 67 | 5 | 0 | 22183 | 7114 | 532 | 0.00 | 48.30 | 15.49 | 1.157 |
| 67 | 6 | 4604677 | 55033 | 163553 | 3181 | 104.42 | 1.25 | 3.71 | .072 |
| 67 | 7 | 2373455 | 33615 | 92100 | 5689 | 42.74 | .61 | 1.66 | .102 |
| 67 | 8 | 820891 | 23696 | 49622 | 2251 | 28.70 | .83 | 1.73 | .079 |
| 67 | 9 | 2304389 | 40463 | 54572 | 2563 | 59.87 | 1.05 | 1.42 | .067 |
| 67 | 10 | 2217320 | 28221 | 187652 | 12380 | 20.37 | .26 | 1.72 | .114 |
| 67 | 11 | 301592 | 12125 | 17759 | 4891 | 9.43 | .38 | .56 | .153 |
| 17 | 11 | 301592 | 12125 | 17759 | 4891 | 9.43 | .38 | .56 | .153 |
| 67 | 12 | 365182 | 29254 | 41714 | 1881 | 23.09 | 1.85 | 2.64 | .119 |
| | | 14473344 | 308899 | 654371 | 36939 | 40.85 | .87 | 1.85 | .104 |
| 68 | 1 | 437347 | 9235 | 6628 | 705 | 94.22 | 1.99 | 1.43 | .152 |
| 68 | 2 | 1441482 | 40657 | 26010 | 1296 | 138.85 | 3.92 | 2.51 | .125 |
| 68 | 3 | 549985 | 27763 | 22501 | 1032 | 42.18 | 2.13 | 1.73 | .079 |
| 68 | 4 | 0 | 11565 | 3526 | 271 | 0.00 | 56.74 | 17.30 | 1.328 |
| 68 | 5 | 3182001 | 45498 | 74430 | 2851 | 56.21 | .80 | 1.31 | .050 |
| 68 | 6 | 3839770 | 56262 | 1968014 | 22920 | 15.63 | .23 | 8.01 | .093 |
| 68 | 7 | 1536876 | 26598 | 419814 | 29044 | 10.93 | .19 | 2.98 | .207 |
| 68 | 8 | 1409255 | 24568 | 110435 | 4749 | 22.58 | .39 | 1.77 | .076 |
| 68 | 9 | 1215828 | 22470 | 94811 | 4648 | 18.94 | .35 | 1.48 | .072 |
| 68 | 10 | 887188 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 68 11 | 98[illegible] | 15817 | 21760 | 4813 | 25.50 | .41 | .57 | .125 |
| 68 12 | [illegible]0 | 0 | 16369 | 657 | 0.00 | 0.00 | 2.69 | .108 |
| | 15477268 | 305310 | 2966924 | 86458 | 20.28 | .40 | 3.89 | .113 |
| I | 15477268 | 305310 | 2966924 | 86458 | 20.28 | .40 | 3.89 | .113 |
| 69 1 | 486485 | 28788 | 19657 | 3109 | 22.66 | 1.34 | .92 | .145 |
| 69 2 | 572726 | 22412 | 12332 | 734 | 63.06 | 2.47 | 1.36 | .081 |
| 69 3 | 1292809 | 26885 | 23336 | 1626 | 36.87 | .77 | .67 | .046 |
| 69 4 | 218012 | 16475 | 10005 | 797 | 17.21 | 1.30 | .79 | .063 |
| 69 5 | 1348981 | 22861 | 40695 | 1579 | 31.94 | .54 | .96 | .037 |
| 69 6 | 3619821 | 42206 | 325348 | 4619 | 42.64 | .50 | 3.83 | .054 |
| 69 7 | 828281 | 20263 | 151744 | 10454 | 16.87 | .41 | 3.09 | .213 |
| 69 8 | 937900 | 19099 | 105635 | 4536 | 15.45 | .31 | 1.74 | .075 |
| 69 9 | 1879613 | 28318 | 87649 | 4259 | 27.89 | .42 | 1.30 | .063 |
| 69 10 | 1673314 | 32965 | 157536 | 10225 | 14.64 | .29 | 1.38 | .089 |
| 69 11 | 645751 | 17060 | 39739 | 11881 | 7.13 | .19 | .44 | .131 |
| 69 12 | 263957 | 7428 | 110123 | 4481 | 6.14 | .17 | 2.56 | .104 |
| | 13767650 | 284760 | 1083799 | 58298 | 21.84 | .45 | 1.72 | .092 |
| 70 1 | 545444 | 26776 | 24939 | 4658 | 17.48 | .86 | .80 | .149 |
| 70 2 | 1055514 | 15834 | 35633 | 1905 | 25.18 | .38 | .85 | .045 |
| 70 2 | 1055514 | 15834 | 35633 | 1905 | 25.18 | .38 | .85 | .045 |
| 70 3 | 1967009 | 54758 | 71699 | 4791 | 15.89 | .44 | .58 | .039 |
| 70 4 | 88721 | 4837 | 18944 | 1825 | 2.00 | .11 | .43 | .041 |
| 70 5 | 1557929 | 53290 | 36329 | 1728 | 81.00 | 2.77 | 1.89 | .090 |
| 70 6 | 2345855 | 36356 | 558441 | 7021 | 31.02 | .48 | 7.38 | .093 |
| 70 7 | 1882373 | 28368 | 166665 | 11259 | 33.06 | .50 | 2.93 | .198 |
| 70 8 | 1258373 | 22396 | 84801 | 3666 | 26.18 | .47 | 1.76 | .076 |
| 70 9 | 2322623 | 33542 | 54941 | 2652 | 58.92 | .85 | 1.39 | .067 |
| 70 10 | 787424 | 19009 | 80241 | 5348 | 16.87 | .41 | 1.72 | .115 |
| 70 11 | 0 | 0 | 2288 | 837 | 0.00 | 0.00 | .41 | .150 |
| 70 12 | 56279 | 21930 | 6979 | 521 | 106.74 | 41.59 | 13.24 | .989 |
| | 13867544 | 317096 | 1141899 | 46212 | 26.00 | .59 | 2.14 | .087 |
| 71 1 | 397055 | 6534 | 4063 | 201 | 218.05 | 3.59 | 2.23 | .110 |
| 71 2 | 95592 | 11613 | 4039 | 284 | 129.31 | 15.71 | 5.46 | .385 |
| 71 3 | 0 | 0 | 0 | 0 | I | I | I | I |
| 71 4 | 20628 | 602 | 291 | 17 | 291.93 | 8.52 | 4.12 | .235 |
| 71 5 | 807090 | 25373 | 21180 | 905 | 94.88 | 2.98 | 2.49 | .106 |
| 71 5 | 807090 | 25373 | 21180 | 905 | 94.88 | 2.98 | 2.49 | .106 |
| 71 6 | 3856835 | 57420 | 122137 | 2792 | 126.35 | 1.88 | 4.00 | .091 |
| 71 7 | 1661743 | 33191 | 119731 | 7794 | 39.96 | .80 | 2.88 | .187 |
| 71 8 | 1393380 | 24929 | 56928 | 2515 | 43.28 | .77 | 1.77 | .078 |
| 71 9 | 1807857 | 26277 | 74008 | 3588 | 33.90 | .49 | 1.39 | .067 |
| 71 10 | 1618104 | 26942 | 34762 | 2065 | 62.65 | 1.04 | 1.35 | .080 |
| 71 11 | 1969475 | 26194 | 48241 | 10033 | 21.46 | .29 | .53 | .109 |
| 71 12 | 81618 | 28799 | 63169 | 2762 | 2.96 | 1.04 | 2.29 | .100 |
| | 13709377 | 267873 | 548550 | 32955 | 43.66 | .85 | 1.75 | .105 |
| 72 1 | 457896 | 18868 | 19323 | 3681 | 18.52 | .76 | .78 | .149 |
| 72 2 | 340123 | 11227 | 16807 | 950 | 18.91 | .62 | .93 | .053 |
| 72 3 | 1015992 | 22625 | 14929 | 716 | 136.09 | 3.03 | 2.00 | .096 |
| 72 4 | 994667 | 44014 | 34906 | 1578 | 30.29 | 1.34 | 1.06 | .048 |
| 72 5 | 1763735 | 34499 | 132737 | 4706 | 15.04 | .29 | 1.13 | .040 |
| 72 6 | 2529520 | 30135 | 1320249 | 15134 | 16.23 | .19 | 8.47 | .097 |
| 72 7 | 957070 | 22480 | 173893 | 11978 | 16.03 | .38 | 2.91 | .201 |
| 72 7 | 957070 | 22480 | 173893 | 11978 | 16.03 | .38 | 2.91 | .201 |
| 72 8 | 352797 | 15785 | 94794 | 4105 | 6.96 | .31 | 1.87 | .081 |
| 72 9 | 248407 | 12882 | 52543 | 2635 | 7.45 | .39 | 1.58 | .079 |
| 72 10 | 769163 | 17590 | 32997 | 2121 | 42.51 | .97 | 1.82 | .117 |
| 72 11 | 239880 | 15457 | 16843 | 4372 | 8.45 | .54 | .59 | .154 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 10310902 | 264692 | 1950914 | 53774 | 18.33 | .47 | 3.47 | .096 |
| 73 | 1 | 842791 | 24084 | 15496 | 752 | 74.17 | 2.12 | 1.36 | .066 |
| 73 | 2 | 815715 | 15588 | 10303 | 536 | 103.21 | 1.97 | 1.30 | .068 |
| 73 | 3 | 987382 | 23238 | 12345 | 674 | 150.75 | 3.55 | 1.88 | .103 |
| 73 | 4 | 188270 | 15619 | 6753 | 489 | 53.16 | 4.41 | 1.91 | .138 |
| 73 | 5 | 709371 | 21952 | 20845 | 892 | 64.83 | 2.01 | 1.91 | .082 |
| 73 | 6 | 3208268 | 59222 | 290767 | 4687 | 70.55 | 1.30 | 6.39 | .103 |
| 73 | 7 | 1129934 | 45599 | 325308 | 21842 | 10.14 | .41 | 2.92 | .196 |
| 73 | 8 | 1315851 | 32484 | 135501 | 5796 | 16.36 | .40 | 1.68 | .072 |
| 73 | 9 | 1817872 | 24060 | 156535 | 7585 | 16.07 | .21 | 1.38 | .067 |
| 73 | 9 | 1817872 | 24060 | 156535 | 7585 | 16.07 | .21 | 1.38 | .067 |
| 73 | 10 | 1063115 | 19518 | 137980 | 9233 | 13.10 | .24 | 1.70 | .114 |
| 73 | 11 | 436471 | 16289 | 15871 | 3591 | 17.15 | .64 | .62 | .141 |
| 73 | 12 | 861874 | 20915 | 53113 | 2291 | 34.67 | .84 | 2.14 | .092 |
| | | 13376914 | 318568 | 1180816 | 58368 | 25.62 | .61 | 2.26 | .112 |
| 74 | 1 | 787888 | 25091 | 46906 | 9323 | 10.20 | .32 | .61 | .121 |
| 74 | 2 | 0 | 12749 | 14109 | 866 | 0.00 | .88 | .97 | .060 |
| 74 | 3 | 347036 | 14876 | 6344 | 391 | 65.35 | 2.80 | 1.19 | .074 |
| 74 | 4 | 7139 | 908 | 314 | 22 | 50.51 | 6.43 | 2.22 | .157 |
| 74 | 5 | 5736 | 287 | 118 | 7 | 81.18 | 4.07 | 1.66 | .105 |
| 74 | 6 | 1828869 | 28093 | 138413 | 2187 | 58.69 | .90 | 4.44 | .070 |
| 74 | 7 | 3135337 | 37480 | 123120 | 7924 | 50.72 | .61 | 1.99 | .128 |
| 74 | 8 | 605434 | 15699 | 134474 | 5741 | 7.99 | .21 | 1.78 | .076 |
| 74 | 9 | 1772279 | 29324 | 81016 | 3959 | 30.06 | .50 | 1.37 | .067 |
| 74 | 10 | 941557 | 12409 | 117207 | 7822 | 13.30 | .18 | 1.66 | .110 |
| 74 | 11 | 2298702 | 39484 | 32100 | 4157 | 72.43 | 1.24 | 1.01 | .131 |
| 74 | 11 | 2298702 | 39484 | 32100 | 4157 | 72.43 | 1.24 | 1.01 | .131 |
| 74 | 12 | 1201301 | 16675 | 91811 | 3766 | 33.67 | .47 | 2.57 | .106 |
| | | 12931279 | 233075 | 785930 | 46166 | 27.92 | .50 | 1.70 | .100 |
| 75 | 1 | 0 | 10057 | 8288 | 1722 | 0.00 | 1.00 | .83 | .172 |
| 75 | 2 | 0 | 6990 | 4002 | 268 | 0.00 | 2.69 | 1.54 | .103 |
| 75 | 3 | 184811 | 23395 | 8179 | 579 | 151.11 | 19.13 | 6.69 | .474 |
| 75 | 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 5 | 692068 | 28708 | 22020 | 1024 | 57.78 | 2.40 | 1.84 | .085 |
| 75 | 6 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 7 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 8 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 9 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 10 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 11 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 12 | 0 | 0 | 0 | 0 | I | I | I | I |
| | | 876879 | 69150 | 42488 | 3593 | 33.93 | 2.68 | 1.64 | .139 |

AJYQEQH. 18.14.30. 77/02/12.

EXHIBIT 7.4: CLADM Quality Output for Western C-51 Using Planned Scenario

Note: Notations Used in This Exhibit is the same in Exhibit 7.3

AJYIFGD

77/02/16. 17.10.00.

WEST C-51 BASIN
PLAN SCENARIO LAND USES

| | | TLSS | TLBOD | TLN | TLP | TCSS | TCBOD | TGN | TGP |
|---|---|---|---|---|---|---|---|---|---|
| 63 | 1 | 43749 | 56205 | 10819 | 2578 | 3.95 | 5.08 | .98 | .233 |
| 63 | 2 | 1101550 | 91049 | 27152 | 2632 | 40.54 | 3.35 | 1.00 | .097 |
| 63 | 3 | 159807 | 76821 | 19517 | 2229 | 8.07 | 3.88 | .99 | .113 |
| 13 | 3 | 159807 | 76821 | 19517 | 2229 | 8.07 | 3.88 | .99 | .113 |
| 63 | 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 63 | 5 | 1803205 | 67682 | 74212 | 5026 | 39.51 | 1.48 | 1.63 | .110 |
| 63 | 6 | 1953479 | 76819 | 180305 | 3681 | 65.67 | 2.58 | 6.06 | .124 |
| 63 | 7 | 471183 | 50283 | 29365 | 2337 | 39.40 | 4.20 | 2.46 | .195 |
| 63 | 8 | 3426856 | 106767 | 51760 | 3547 | 113.77 | 3.54 | 1.72 | .118 |
| 63 | 9 | 4354717 | 95774 | 117218 | 6467 | 54.13 | 1.19 | 1.46 | .080 |
| 63 | 10 | 709378 | 46437 | 137821 | 9860 | 9.03 | .59 | 1.75 | .126 |
| 63 | 11 | 911842 | 65791 | 22462 | 5375 | 29.79 | 2.15 | .73 | .176 |
| 63 | 12 | 1182709 | 135580 | 64761 | 4354 | 33.01 | 3.78 | 1.81 | .122 |
| | | 16118475 | 869208 | 735392 | 48084 | 40.20 | 2.17 | 1.83 | .120 |
| 64 | 1 | 774662 | 55994 | 30258 | 7004 | 17.50 | 1.26 | .68 | .158 |
| 64 | 2 | 1204766 | 75380 | 36592 | 2748 | 33.09 | 2.07 | 1.00 | .075 |
| 64 | 3 | 1165904 | 81124 | 23705 | 2259 | 61.98 | 4.31 | 1.26 | .120 |
| 64 | 4 | 1434058 | 101126 | 32188 | 2766 | 56.24 | 3.97 | 1.26 | .108 |
| 64 | 5 | 1118847 | 59525 | 37641 | 2189 | 39.43 | 2.10 | 1.33 | .077 |
| 14 | 5 | 1118847 | 59525 | 37641 | 2189 | 39.43 | 2.10 | 1.33 | .077 |
| 64 | 6 | 2984499 | 96861 | 312101 | 5683 | 43.47 | 1.41 | 4.55 | .083 |



Figure 12

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 64 8 | 2388410 | 100826 | 74024 | 4215 | 45.81 | 1.93 | 1.42 | .081 |
| 64 9 | 1[illegible]87 | 72892 | 114970 | 6548 | 15.21 | .97 | 1.53 | .087 |
| 64 10 | 2953023 | 104008 | 108516 | 7339 | 39.24 | 1.38 | 1.44 | .097 |
| 64 11 | 644001 | 66628 | 30282 | 8756 | 11.46 | 1.19 | .54 | .156 |
| 64 12 | 970156 | 68449 | 93703 | 4772 | 25.84 | 1.82 | 2.50 | .127 |
| | 17866754 | 955819 | 1023793 | 64036 | 31.94 | 1.71 | 1.83 | .114 |
| 65 1 | 46064 | 55115 | 12077 | 2942 | 3.50 | 4.19 | .92 | .224 |
| 65 2 | 1943696 | 88678 | 24128 | 2291 | 112.66 | 5.14 | 1.40 | .133 |
| 65 3 | 348168 | 49865 | 7728 | 1127 | 71.37 | 10.22 | 1.58 | .231 |
| 65 4 | 322859 | 57758 | 13886 | 1366 | 61.42 | 10.99 | 2.64 | .260 |
| 65 5 | 170695 | 12894 | 2250 | 282 | 269.56 | 20.36 | 3.55 | .445 |
| 65 6 | 3336270 | 132115 | 126537 | 4838 | 57.87 | 2.29 | 2.20 | .084 |
| 65 6 | 3336270 | 132115 | 126537 | 4838 | 57.87 | 2.29 | 2.20 | .084 |
| 65 7 | 3597863 | 91882 | 266481 | 18673 | 35.22 | .90 | 2.61 | .183 |
| 65 8 | 1119718 | 67857 | 114307 | 5756 | 17.83 | 1.08 | 1.82 | .092 |
| 65 9 | 2570267 | 83940 | 58753 | 3796 | 63.49 | 2.07 | 1.45 | .094 |
| 65 10 | 2300266 | 98978 | 233135 | 15708 | 14.25 | .61 | 1.44 | .097 |
| 65 11 | 89776 | 1995 | 52471 | 18987 | .70 | .02 | .41 | .149 |
| 65 12 | 955440 | 42648 | 62709 | 4707 | 47.37 | 2.11 | 3.11 | .233 |
| | 16801082 | 783725 | 974462 | 80473 | 27.40 | 1.28 | 1.59 | .131 |
| 66 1 | 3852609 | 86335 | 56364 | 8015 | 62.34 | 1.40 | .91 | .130 |
| 66 2 | 566987 | 67145 | 50132 | 3321 | 9.84 | 1.17 | .87 | .058 |
| 66 3 | 176722 | 68423 | 22913 | 2905 | 4.34 | 1.68 | .56 | .071 |
| 66 4 | 773498 | 85771 | 24999 | 2176 | 32.68 | 3.62 | 1.06 | .092 |
| 66 5 | 2197202 | 83652 | 40311 | 2640 | 58.11 | 2.21 | 1.07 | .070 |
| 66 6 | 2847220 | 88084 | 772537 | 10518 | 23.29 | .72 | 6.32 | .086 |
| 66 7 | 1615028 | 77040 | 448642 | 31973 | 11.74 | .56 | 3.26 | .232 |
| 66 8 | 2491016 | 83232 | 159844 | 7699 | 22.22 | .74 | 1.43 | .069 |
| 66 8 | 2491016 | 83232 | 159844 | 7699 | 22.22 | .74 | 1.43 | .069 |
| 66 9 | 2263840 | 54050 | 69370 | 3903 | 35.78 | .85 | 1.10 | .062 |
| 66 10 | 971968 | 72644 | 117483 | 8750 | 13.21 | .99 | 1.60 | .119 |
| 66 11 | 227138 | 67158 | 16080 | 4384 | 10.32 | 3.05 | .73 | .199 |
| 66 12 | 799287 | 59208 | 35746 | 2314 | 57.82 | 4.28 | 2.59 | .167 |
| | 18782515 | 892742 | 1814421 | 88598 | 24.51 | 1.17 | 2.37 | .116 |
| 67 1 | 303210 | 86752 | 15981 | 3419 | 23.82 | 6.82 | 1.26 | .269 |
| 67 2 | 869154 | 84847 | 36654 | 2609 | 37.30 | 3.64 | 1.57 | .112 |
| 67 3 | 475299 | 79731 | 12146 | 1814 | 73.05 | 12.25 | 1.87 | .279 |
| 67 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 67 5 | 0 | 0 | 0 | 0 | I | I | I | I |
| 67 6 | 5712870 | 165396 | 344914 | 7679 | 87.93 | 2.55 | 5.31 | .118 |
| 67 7 | 1892815 | 59516 | 137245 | 9140 | 26.81 | .84 | 1.94 | .129 |
| 67 8 | 1478889 | 96256 | 63254 | 4030 | 41.79 | 2.72 | 1.79 | .114 |
| 67 9 | 3263286 | 96417 | 72217 | 4425 | 64.02 | 1.89 | 1.42 | .087 |
| 67 10 | 2874942 | 68892 | 211032 | 14634 | 23.15 | .55 | 1.70 | .118 |
| 67 10 | 2874942 | 68892 | 211032 | 14634 | 23.15 | .55 | 1.70 | .118 |
| 67 11 | 427060 | 51987 | 20832 | 5960 | 12.39 | 1.51 | .60 | .173 |
| 67 12 | 1167424 | 105176 | 56687 | 3778 | 56.89 | 5.13 | 2.76 | .184 |
| | 18464949 | 894970 | 970964 | 57489 | 41.62 | 2.02 | 2.19 | .130 |
| 68 1 | 641019 | 33472 | 8298 | 1131 | 136.73 | 7.14 | 1.77 | .241 |
| 68 2 | 2045576 | 122939 | 35154 | 3211 | 108.89 | 6.54 | 1.87 | .171 |
| 68 3 | 1048755 | 57292 | 25919 | 1861 | 55.34 | 3.02 | 1.37 | .098 |
| 68 4 | 134365 | 61239 | 6700 | 1230 | 168.16 | 76.64 | 8.38 | 1.539 |
| 68 5 | 3247802 | 109687 | 104305 | 5011 | 45.21 | 1.53 | 1.45 | .070 |
| 68 6 | 4590726 | 97241 | 2045386 | 24898 | 17.72 | .38 | 7.90 | .096 |
| 68 7 | 1936861 | 80778 | 440793 | 31393 | 12.86 | .54 | 2.93 | .208 |
| 68 8 | 1666052 | 76569 | 121880 | 6163 | 23.55 | 1.08 | 1.72 | .087 |
| 68 9 | 1973333 | 79431 | 111958 | 6394 | 26.24 | 1.06 | 1.49 | .085 |
| 68 10 | 1304729 | 67511 | 720316 | 15210 | 9.75 | .52 | 1.72 | .118 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 68 | 11 | 5[illegible]1285 | 49412 | 25554 | 5544 | 13.02 | 1.23 | .64 | .139 |
| ■8 | 11 | [illegible]285 | 49412 | 25554 | 5544 | 13.02 | 1.23 | .64 | .139 |
| 68 | 12 | 0 | 0 | 14614 | 587 | 0.00 | 0.00 | 2.69 | .108 |
| | | 19010102 | 835571 | 3161476 | 102632 | 22.50 | .99 | 3.74 | .121 |
| 69 | 1 | 822961 | 35465 | 32111 | 5328 | 36.73 | 1.58 | 1.43 | .238 |
| 69 | 2 | 760055 | 101107 | 24616 | 2527 | 58.38 | 7.77 | 1.89 | .194 |
| 69 | 3 | 2717802 | 102663 | 42763 | 3717 | 61.07 | 2.31 | .96 | .084 |
| 69 | 4 | 841834 | 81047 | 16403 | 2096 | 64.13 | 6.17 | 1.25 | .160 |
| 69 | 5 | 2371738 | 84150 | 69536 | 3540 | 44.30 | 1.57 | 1.30 | .066 |
| 69 | 6 | 4102763 | 107749 | 563478 | 8827 | 36.66 | .96 | 5.03 | .079 |
| 69 | 7 | 1379951 | 76953 | 168371 | 12428 | 24.95 | 1.39 | 3.04 | .225 |
| 69 | 8 | 1554336 | 63925 | 125619 | 6130 | 21.24 | .87 | 1.72 | .084 |
| 69 | 9 | 3912768 | 92529 | 113137 | 6403 | 48.80 | 1.15 | 1.41 | .080 |
| 69 | 10 | 3340126 | 83693 | 177904 | 12209 | 26.71 | .67 | 1.42 | .098 |
| 69 | 11 | 1063234 | 71447 | 51443 | 13591 | 11.14 | .75 | .54 | .142 |
| 69 | 12 | 584615 | 30459 | 122457 | 5355 | 12.34 | .64 | 2.58 | .113 |
| | | 23452183 | 931187 | 1507838 | 82150 | 31.90 | 1.27 | 2.05 | .112 |
| ■ | | 23452183 | 931187 | 1507838 | 82150 | 31.90 | 1.27 | 2.05 | .112 |
| 70 | 1 | 1091621 | 119749 | 34791 | 7322 | 27.92 | 3.06 | .89 | .187 |
| 70 | 2 | 1488242 | 45139 | 40605 | 2656 | 32.14 | .97 | .88 | .057 |
| 70 | 3 | 2120739 | 112631 | 80024 | 6513 | 15.26 | .81 | .58 | .047 |
| 70 | 4 | 205002 | 21935 | 21536 | 2287 | 4.26 | .46 | .45 | .048 |
| 70 | 5 | 2156084 | 50179 | 47114 | 3898 | 79.17 | 1.84 | 1.73 | .143 |
| 70 | 6 | 3329219 | 73675 | 649774 | 8864 | 37.67 | .83 | 7.35 | .100 |
| 70 | 7 | 3103478 | 84995 | 202608 | 14493 | 44.67 | 1.22 | 2.92 | .209 |
| 70 | 8 | 1104673 | 72363 | 95331 | 4946 | 20.72 | 1.36 | 1.79 | .093 |
| 70 | 9 | 2307251 | 96989 | 77544 | 4814 | 41.88 | 1.76 | 1.41 | .087 |
| 70 | 10 | 1201810 | 70944 | 93221 | 7014 | 22.14 | 1.31 | 1.72 | .129 |
| 70 | 11 | 0 | 0 | 1702 | 623 | 0.00 | 0.00 | .41 | .150 |
| 70 | 12 | 274502 | 133435 | 17195 | 2785 | 108.49 | 52.74 | 6.80 | 1.101 |
| | | 18382621 | 882034 | 1361443 | 66213 | 29.32 | 1.41 | 2.17 | .106 |
| 71 | 1 | 1281057 | 54400 | 12796 | 1278 | 240.98 | 10.23 | 2.41 | .240 |
| ■1 | 1 | 1281057 | 54400 | 12796 | 1278 | 240.98 | 10.23 | 2.41 | .240 |
| 71 | 2 | 451518 | 72909 | 11170 | 1594 | 110.54 | 17.85 | 2.73 | .390 |
| 71 | 3 | 161269 | 29627 | 3821 | 612 | 226.48 | 41.61 | 5.37 | .860 |
| 71 | 4 | 1461135 | 123688 | 20543 | 2674 | 278.13 | 23.54 | 3.91 | .509 |
| 71 | 5 | 1514933 | 67698 | 33201 | 2061 | 89.07 | 3.98 | 1.95 | .121 |
| 71 | 6 | 4242730 | 124732 | 291378 | 6004 | 81.84 | 2.41 | 5.62 | .116 |
| 71 | 7 | 2379781 | 77847 | 159900 | 11344 | 41.84 | 1.37 | 2.81 | .199 |
| 71 | 8 | 2461913 | 85951 | 78405 | 4420 | 56.57 | 1.97 | 1.80 | .102 |
| 71 | 9 | 3175483 | 70874 | 91769 | 5133 | 49.69 | 1.11 | 1.44 | .080 |
| 71 | 10 | 1633588 | 92385 | 60699 | 4724 | 40.40 | 2.28 | 1.50 | .117 |
| 71 | 11 | 1659970 | 33850 | 50287 | 10566 | 17.26 | .35 | .52 | .110 |
| 71 | 12 | 149689 | 114402 | 77416 | 4759 | 4.83 | 3.69 | 2.50 | .154 |
| | | 20575066 | 948363 | 891384 | 55169 | 49.44 | 2.28 | 2.14 | .133 |
| 72 | 1 | 1182963 | 83222 | 29644 | 6000 | 34.70 | 2.44 | .87 | .176 |
| 72 | 2 | 770995 | 44997 | 23676 | 1833 | 32.21 | 1.88 | .99 | .077 |
| ■2 | 2 | 770995 | 44997 | 23676 | 1833 | 32.21 | 1.88 | .99 | .077 |
| 72 | 3 | 866435 | 124951 | 35444 | 3146 | 46.91 | 6.77 | 1.92 | .170 |
| 72 | 4 | 855161 | 89127 | 42495 | 3065 | 17.58 | 1.83 | .87 | .063 |
| 72 | 5 | 2201495 | 81569 | 142921 | 5963 | 16.92 | .63 | 1.10 | .046 |
| 72 | 6 | 2906343 | 67126 | 1375962 | 16507 | 17.42 | .40 | 8.25 | .099 |
| 72 | 7 | 1198706 | 82205 | 188761 | 13966 | 18.04 | 1.24 | 2.84 | .210 |
| 72 | 8 | 748807 | 68028 | 119586 | 6011 | 11.43 | 1.04 | 1.83 | .092 |
| 72 | 9 | 508884 | 59604 | 61337 | 3818 | 13.28 | 1.56 | 1.60 | .100 |
| 72 | 10 | 1112995 | 64654 | 38652 | 3221 | 52.88 | 3.07 | 1.84 | .153 |
| 72 | 11 | 486173 | 70849 | 21725 | 5874 | 15.09 | 2.20 | .67 | .182 |
| 72 | 12 | 154296 | 78576 | 50527 | 3187 | 8.11 | 4.13 | 2.66 | .167 |
| | | 12993253 | 914908 | 2130731 | 72591 | 19.55 | 1.38 | 3.21 | .109 |

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1-32

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 73 | 1 | 2208327 | 104731 | 36359 | 3156 | 104.60 | 4.96 | 1.72 | .150 |
| 73 | 2 | 1395205 | 53971 | 17208 | 1498 | 109.76 | 4.25 | 1.35 | .118 |
| 73 | 3 | 1044621 | 89234 | 22383 | 2260 | 85.02 | 7.26 | 1.82 | .184 |
| 73 | 3 | 1044621 | 89234 | 22383 | 2260 | 85.02 | 7.26 | 1.82 | .184 |
| 73 | 4 | 443341 | 71916 | 10367 | 1571 | 113.52 | 18.41 | 2.65 | .402 |
| 73 | 5 | 1194128 | 52752 | 24338 | 1601 | 90.52 | 4.00 | 1.84 | .121 |
| 73 | 6 | 3542335 | 131139 | 393553 | 7362 | 60.46 | 2.24 | 6.72 | .126 |
| 73 | 7 | 2936261 | 97384 | 360443 | 24980 | 23.62 | .78 | 2.90 | .201 |
| 73 | 8 | 2691778 | 91852 | 162076 | 7911 | 28.05 | .96 | 1.69 | .082 |
| 73 | 9 | 2753729 | 63581 | 174882 | 9120 | 21.78 | .50 | 1.38 | .072 |
| 73 | 10 | 1541913 | 64312 | 157718 | 11254 | 16.52 | .69 | 1.69 | .121 |
| 73 | 11 | 843778 | 70477 | 20626 | 4765 | 31.22 | 2.61 | .76 | .176 |
| 73 | 12 | 1186312 | 83239 | 74055 | 4126 | 38.13 | 2.68 | 2.38 | .133 |
| | | 21781728 | 974588 | 1454008 | 79604 | 35.13 | 1.57 | 2.35 | .128 |
| 74 | 1 | 1700590 | 75310 | 59280 | 10677 | 21.22 | .94 | .74 | .133 |
| 74 | 2 | 53109 | 51420 | 16715 | 1659 | 3.21 | 3.10 | 1.01 | .100 |
| 74 | 3 | 633541 | 93109 | 19156 | 2153 | 74.62 | 10.97 | 2.26 | .254 |
| 74 | 4 | 437422 | 36328 | 6082 | 787 | 252.67 | 20.98 | 3.51 | .454 |
| 74 | 4 | 437422 | 36328 | 6082 | 787 | 252.67 | 20.98 | 3.51 | .454 |
| 74 | 5 | 1457846 | 80296 | 16336 | 1818 | 275.08 | 15.15 | 3.08 | .343 |
| 74 | 6 | 3821542 | 99951 | 277256 | 5444 | 83.26 | 2.18 | 6.04 | .119 |
| 74 | 7 | 4708238 | 100152 | 202721 | 13789 | 55.72 | 1.19 | 2.40 | .163 |
| 74 | 8 | 1463665 | 60570 | 156196 | 7366 | 16.81 | .70 | 1.79 | .085 |
| 74 | 9 | 3788195 | 100258 | 108494 | 6309 | 51.74 | 1.37 | 1.48 | .086 |
| 74 | 10 | 659161 | 34392 | 127766 | 8784 | 8.68 | .45 | 1.68 | .116 |
| 74 | 11 | 1031872 | 123399 | 38916 | 6267 | 28.37 | 3.39 | 1.07 | .172 |
| 74 | 12 | 427793 | 44863 | 95756 | 4447 | 11.42 | 1.20 | 2.56 | .119 |
| | | 20182974 | 900048 | 1124674 | 69498 | 36.51 | 1.63 | 2.03 | .126 |
| 75 | 1 | 0 | 34398 | 8504 | 2154 | 0.00 | 3.39 | .84 | .212 |
| 75 | 2 | 0 | 26359 | 4464 | 627 | 0.00 | 9.29 | 1.57 | .221 |
| 75 | 3 | 330223 | 30492 | 14905 | 2665 | 126.04 | 11.64 | 5.69 | 1.017 |
| 75 | 4 | 53118 | 48801 | 5021 | 972 | 86.10 | 79.10 | 8.14 | 1.575 |
| 75 | 5 | 1737935 | 104409 | 37948 | 2887 | 82.51 | 4.96 | 1.80 | .137 |
| 75 | 6 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 6 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 7 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 8 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 9 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 10 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 11 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 12 | 0 | 0 | 0 | 0 | I | I | I | I |
| | | 2121276 | 244459 | 70842 | 9306 | 56.90 | 6.56 | 1.90 | .250 |

AJYQFGD. 23.53.31. 77/02/15.

EXHIBIT 7.5: Discharges, Nutrient Loadings and Concentrations for An Alternate of Backpumping C-51 and L-8 Using 1973-74 Land Uses and Planned Scenario.

L-8 Basin Available Backpumped Quantities and Nutrient Loadings

| Date | Historical M-Canal Demands (Ac-Ft) | Historical L-8 Discharges (Ac-Ft) | Historical L-8 Basin Dis. (Ac-Ft) | Future M-Canal Demands (Ac-Ft) | Future Available L-8 Dis. (Ac-Ft) | Total Nitrogen (lbs) | Total Phosphorus (lbs) |
|---|---|---|---|---|---|---|---|
| 1/63 | None | 9388 | Same | 10800 | 0 | 0 | 0 |
| 2 | | 10050 | as | 10900 | 0 | 0 | 0 |
| 3 | | 12309 | L-8 | 10400 | 1909 | 7938 | 280 |
| 4 | | 11423 | Discharges | 10100 | 1323 | 5501 | 194 |
| 5 | | 8918 | | 10600 | 0 | 0 | 0 |
| 6 | | 12383 | | 9700 | 2683 | 12104 | 438 |
| 7 | | 7414 | | 8700 | 0 | 0 | 0 |
| 8 | | 7075 | | 9600 | 0 | 0 | 0 |
| 9 | | 6514 | | 9400 | 0 | 0 | 0 |
| 10 | | 9400 | | 8200 | 1200 | 4631 | 114 |
| 11 | | 2291 | | 8900 | 0 | 0 | 0 |
| 12/63 | | 3205 | | 10400 | 0 | 0 | 0 |
| 1/64 | None | 17821 | | 9400 | 8421 | 35016 | 1236 |
| 2 | | 12783 | | 9200 | 3583 | 14899 | 526 |
| 3 | | 7646 | | 10050 | 0 | 0 | 0 |
| 4 | | 5867 | | 9600 | 0 | 0 | 0 |
| 5 | | 6549 | | 9200 | 0 | 0 | 0 |
| 6 | | 9150 | | 9500 | 0 | 0 | 0 |
| 7 | | 8707 | | 9400 | 0 | 0 | 0 |
| 8 | | 17950 | | 8050 | 9900 | 45740 | 2556 |
| 9 | | 19940 | | 8500 | 11440 | 44150 | 1306 |
| 10 | | 23700 | | 8500 | 15200 | 58660 | 1446 |
| 11 | | 22620 | | 8400 | 14220 | 59130 | 2248 |
| 12/64 | | 21836 | | 8600 | 13236 | 55038 | 1943 |
| 1/65 | 36 | 17574 | 17610 | 10200 | 7410 | 30812 | 1087 |
| 2 | 48 | 12165 | 12213 | 10700 | 1513 | 6291 | 222 |
| 3 | 1872 | 13619 | 15491 | 10400 | 5091 | 21169 | 747 |
| 4 | 1770 | 5821 | 7591 | 10200 | 0 | 0 | 0 |
| 5 | 5424 | 4820 | 10244 | 10400 | 0 | 0 | 0 |
| 6 | 8472 | 8590 | 17062 | 10500 | 6562 | 29605 | 1070* |
| 7 | 5118 | 9802 | 14920 | 8100 | 6826 | 26900 | 557 |
| 8 | 2292 | 11782 | 14074 | 0 | 14074 | 65025 | 3634 |
| 9 | 1938 | 10802 | 12720 | 8200 | 4520 | 17440 | 516 |
| 10 | 0 | 30382 | 30382 | 9100 | 21283 | 82136 | 2025 |
| 11 | 12 | 27582 | 27594 | 7100 | 20482 | 85168 | 3006 |
| 12 | 1926 | 15656 | 17582 | 8200 | 9382 | 39012 | 1377 |

20 (Continued)

| Date | Historical M-Canal Demands (Ac-Ft) | Historical L-8 Discharges (Ac-Ft) | Historical L-8 Basin Dis. (Ac-Ft) | Future M-Canal Demands (Ac-Ft) | Future Available L-8 Dis. (Ac-Ft) | Total Nitrogen (lbs) | Total Phosphorus (lbs) |
|---|---|---|---|---|---|---|---|
| 1/66 | 12 | 19918 | 19930 | 10700 | 9230 | 38380 | 1355 |
| 2 | 0 | 22417 | Same | 9500 | 12917 | 53711 | 1896 |
| 3 | 0 | 21031 | as | 8850 | 12181 | 50651 | 1788 |
| 4 | 0 | 7613 | L-8 | 9900 | 2287 | 9510 | 336 |
| 5 | 0 | 10435 | Discharges | 9700 | 735 | 3056 | 108 |
| 6 | 0 | 37773 | | 8650 | 29123 | 131389 | 4749 |
| 7 | 0 | 41427 | | 7000 | 34627 | 136457 | 2823* |
| 8 | 0 | 40717 | | 6900 | 33817 | 156242 | 8731 |
| 9 | 0 | 42982 | | 7500 | 35402 | 136625 | 4041 |
| 10 | 0 | 26628 | ↓ | 6900 | 9928 | 38315 | 944 |
| 11 | 1920 | 5355 | 7275 | 8450 | 0 | 0 | 0 |
| 12 | 0 | 8795 | 8795 | 10300 | 0 | 0 | 0 |
| 1/67 | 1446 | 8563 | 10009 | 10700 | 0 | 0 | 0 |
| 2 | 7776 | 4903 | 12679 | 10100 | 1979 | 8229 | 290 |
| 3 | 6696 | 6936 | 13632 | 10200 | 3432 | 14271 | 504 |
| 4 | 7824 | 2737 | 10561 | 10200 | 361 | 1501 | 53 |
| 5 | 9528 | 7888 | 17416 | 11000 | 6416 | 26679 | 942 |
| 6 | 6966 | 7367 | 14333 | 11200 | 3133 | 14135 | 511 |
| 7 | 1956 | 13317 | 15273 | 8600 | 6473 | 25312 | 523 |
| 8 | 0 | 12502 | 12502 | 0 | 12502 | 57762 | 2088 |
| 9 | 24 | 7503 | 7527 | 8100 | 0 | 0 | 0 |
| 10 | 12 | 12823 | 12835 | 8900 | 3935 | 15186 | 374 |
| 11 | 426 | 2870 | 3296 | 8500 | 0 | 0 | 0 |
| 12/67 | 6606 | 4735 | 11341 | 9900 | 1441 | 5992 | 211 |
| 1/68 | 3834 | 5820 | 9654 | 10600 | 0 | 0 | 0 |
| 2 | 7752 | 6881 | 14633 | 10400 | 4233 | 17602 | 621 |
| 3 | 5520 | 3423 | 8943 | 10400 | 0 | 0 | 0 |
| 4 | 9186 | 7139 | 16325 | 9800 | 6525 | 27132 | 958 |
| 5 | 6840 | 6450 | 13290 | 10300 | 2990 | 12433 | 439 |
| 6 | 0 | 51447 | 51447 | 9100 | 42583 | 191049 | 6905 |
| 7 | 42 | 48541 | 48583 | 0 | 48583 | 191455 | 3961 |
| 8 | 846 | 14067 | 14913 | 0 | 14913 | 68901 | 3850 |
| 9 | 792 | 10754 | 11546 | 8200 | 3346 | 12913 | 382 |
| 10 | 156 | 33537 | 33693 | 9100 | 24593 | 94910 | 2807 |
| 11 | 990 | 11948 | 12938 | 9100 | 3838 | 15959 | 563 |
| 12/68 | 1986 | 4473 | 6459 | 9700 | 0 | 0 | 0* |

(Continued)

| Date | Historical M-Canal Demands (Ac-Ft) | Historical L-8 Discharges (Ac-Ft) | Historical L-8 Basin Dis. (Ac-Ft) | Future M-Canal Demands (Ac-Ft) | Future Available L-8 Dis. (Ac-Ft) | Total Nitrogen (lbs) | Total Phosphorus (lbs) |
|---|---|---|---|---|---|---|---|
| 1/69 | 5448 | 2085 | Calculation | Same | Same | 8670 | 306 |
| 2 | 7194 | 4514 | not | as | as | 18770 | 662 |
| 3 | 3906 | 20930 | necessary | Historical | Histor. | 87031 | 3072 |
| 4 | 5412 | 4993 | ↓ | Demands | Discharges | 20783 | 734 |
| 5 | 1530 | 5334 | | ↓ | ↓ | 22180 | 783 |
| 6 | 6882 | 16431 | | | | 74129 | 2679 |
| 7 | 4842 | 6373 | | | | 25115 | 520 |
| 8 | 456 | 10600 | | | | 48974 | 2737 |
| 9 | 1740 | 10223 | | | | 39453 | 1167 |
| 10 | 36 | 41810 | | | | 161355 | 3977 |
| 11 | 36 | 27106 | | | | 112712 | 3978 |
| 12/69 | 36 | 19228 | | | | 79954 | 2822 |
| 1/70 | 2808 | 14509 | | | | 60331 | 2129 |
| 2 | 3978 | 16467 | | | | 68473 | 2417 |
| 3 | 4236 | 43916 | | | | 182611 | 6445 |
| 4 | 282 | 38541 | | | | 160261 | 5656 |
| 5 | 6624 | 17484 | | | | 72702 | 2566 |
| 6 | 0 | 30914 | | | | 139469 | 5041 |
| 7 | 7920 | 20763 | | | | 81822 | 1693 |
| 8 | 7692 | 25866 | | | | 119507 | 6678 |
| 9 | 8886 | 31595 | | | | 121933 | 3606 |
| 10 | 7632 | 16792 | | | | 64804 | 1917 |
| 11 | 7806 | 607 | | | | 2524 | 89 |
| 12 | 11418 | 1704 | | | | 7086 | 250 |
| 1/71 | 8556 | 1042 | | | | 4331 | 153 |
| 2 | 7656 | 10 | | | | 42 | 2 |
| 3 | 9552 | 5963 | | | | 24799 | 875 |
| 4 | 5526 | 3362 | | | | 13980 | 493 |
| 5 | 9654 | 318 | | | | 1322 | 47 |
| 6 | 7194 | 250 | | | | 1128 | 41 |
| 7 | 3720 | 887 | | | | 3499 | 72 |
| 8 | 8124 | 137 | | | | 633 | 35 |
| 9 | 1044 | 12264 | | | | 47329 | 1440 |
| 10 | 7488 | 819 | | | | 3261 | 80 |
| 11 | 5550 | 4130 | | | | 17171 | 606 |
| 12/71 | 6468 | 845 | ↓ | ↓ | ↓ | 3514 | 124 |

20 (Continued)

| Date | Historical M-Canal Demands (Ac-Ft) | Historical L-8 Discharges (Ac-Ft) | Historical L-8 Basin Dis. (Ac-Ft) | Future M-Canal Demands (Ac-Ft) | Future Available L-8 Dis. (Ac-Ft) | Total Nitrogen (lbs) | Total Phosphorus (lbs) |
|---|---|---|---|---|---|---|---|
| 1/72 | | 54 | Calculation | Same | Same | 225 | 8 |
| 2 | 7428 | 238 | not | as | as | 990 | 35 |
| 3 | 5894 | 224 | necessary | Histor. | Histor. | 931 | 33 |
| 4 | 7074 | 932 | | Demands | L-8 | 3875 | 137 |
| 5 | 2160 | 5617 | | | Discharge | 23357 | 824 |
| 6 | 0 | 9551 | | | | 43089 | 1557 |
| 7 | 2880 | 6839 | | | | 26951 | 558 |
| 8 | 3326 | 1113 | | | | 5142 | 287 |
| 9 | 3168 | 958 | | | | 3697 | 109 |
| 10 | 8772 | 280 | | | | 1079 | 32 |
| 11 | 7554 | 2 | | | | 8 | 0 |
| 12/72 | 7116 | 58 | | | | 241 | 9 |
| 1/73 | 7656 | 44 | | | | 181 | 6 |
| 2 | 4350 | 0 | | | | 0 | 0 |
| 3 | 3114 | 0 | | | | 0 | 0 |
| 4 | 4890 | 0 | | | | 0 | 0 |
| 5 | 8556 | 0 | | | | 0 | 0 |
| 6 | 4794 | 236 | | | | 1065 | 38 |
| 7 | 5034 | 9578 | | | | 37745 | 1425 |
| 8 | 5472 | 7113 | | | | 32864 | 1836 |
| 9 | 1008 | 7712 | | | | 29761 | 880 |
| 10 | 468 | 5455 | | | | 21050 | 519 |
| 11 | 2940 | 0 | | | | 0 | 0 |
| 12/73 | 8160 | 224 | | | | 931 | 33 |
| 1/74 | 6318 | 1004 | | | | 4173 | 147 |
| 2 | 4908 | 363 | | | | 1509 | 53 |
| 3 | 9258 | 91 | | | | 379 | 13 |
| 4 | 7020 | 0 | | | | 0 | 0 |
| 5 | 5088 | 0 | | | | 0 | 0 |
| 6 | 9192 | 1527 | | | | 6889 | 249 |
| 7 | 6972 | 11903 | | | | 46907 | 970 |
| 8 | 7758 | 10790 | | | | 49852 | 2786 |
| 9 | 7494 | 2123 | | | | 8191 | 242 |
| 10 | 7152 | 5381 | | | | 20767 | 512 |
| 11 | 6156 | 1337 | | | | 5560 | 196 |
| 12/74 | 9624 | 26 | | | | 108 | 4 |

Figure 21 1973-4 Land Uses West Palm Beach Backpumping Alternative West C-51 Plus L-8 Basins.

| Date | Discharge (Ac-Ft) | TOTAL NITROGEN Loading (lbs) | TOTAL NITROGEN Concentrations (mg/1) | TOTAL PHOSPHORUS Loading (lbs) | TOTAL PHOSPHORUS Concentrations (mg/1) |
|---|---|---|---|---|---|
| 1/63 | 3469 | 8268 | 0.88 | 1599 | 0.170 |
| 2 | 7053 | 14414 | 0.75 | 880 | 0.046 |
| 3 | 8018 | 21799 | 1.00 | 1263 | 0.058 |
| 4 | 1870 | 6096 | 1.20 | 253 | 0.050 |
| 5 | 12599 | 39971 | 1.17 | 1801 | 0.053 |
| 6 | 9992 | 108573 | 4.00 | 2008 | 0.074 |
| 7 | 2999 | 16610 | 2.04 | 1023 | 0.125 |
| 8 | 5496 | 20100 | 1.35 | 1003 | 0.067 |
| 9 | 25718 | 101170 | 1.45 | 4776 | 0.068 |
| 10 | 26725 | 126587 | 1.74 | 8374 | 0.115 |
| 11 | 10034 | 17751 | 0.65 | 4056 | 0.149 |
| 12 | 8864 | 38717 | 1.61 | 1780 | 0.074 |
| 1/64 | 22276 | 59493 | 0.98 | 6678 | 0.110 |
| 2 | 14994 | 43637 | 1.07 | 2023 | 0.050 |
| 3 | 4350 | 17814 | 1.51 | 940 | 0.080 |
| 4 | 4709 | 20184 | 1.58 | 946 | 0.074 |
| 5 | 9804 | 35045 | 1.31 | 1346 | 0.050 |
| 6 | 19456 | 189124 | 3.58 | 3391 | 0.064 |
| 7 | 11627 | 102997 | 3.26 | 7120 | 0.225 |
| 8 | 22773 | 91773 | 1.48 | 4577 | 0.074 |
| 9 | 34829 | 141534 | 1.50 | 6120 | 0.065 |
| 10 | 38147 | 140256 | 1.35 | 6217 | 0.060 |
| 11 | 33410 | 84889 | 0.93 | 9574 | 0.105 |
| 12 | 24466 | 131192 | 1.97 | 5139 | 0.077 |
| 1/65 | 11702 | 40855 | 1.28 | 3100 | 0.097 |
| 2 | 6259 | 22134 | 1.30 | 1028 | 0.060 |
| 3 | 5091 | 21169 | 1.53 | 747 | 0.054 |
| 4 | 0 | 0 | - | 0 | - |
| 5 | 0 | 0 | - | 0 | - |
| 6 | 18522** | 88669 | 1.76 | 3554 | 0.071** |
| 7 | 39145 | 263053 | 2.47 | 16083 | 0.151 |
| 8 | 33704 | 163517 | 1.79 | 7880 | 0.086 |
| 9 | 15534 | 60093 | 1.42 | 2597 | 0.062 |
| 10 | 76340 | 293362 | 1.41 | 15589 | 0.075 |
| 11 | 63204 | 132895 | 0.77 | 20295 | 0.118 |
| 12/65 | 15396 | 85263 | 2.04 | 3538 | 0.085 |

(Continued)

| Date | Discharge (Ac-Ft) | TOTAL NITROGEN Loading (lbs) | TOTAL NITROGEN Concentrations (mg/l) | TOTAL PHOSPHORUS Loading (lbs) | TOTAL PHOSPHORUS Concentrations (mg/l) |
|---|---|---|---|---|---|
| 1/66 | 27339 | 68634 | 0.92 | 6372 | 0.086 |
| 2 | 32988 | 92551 | 1.03 | 3999 | 0.045 |
| 3 | 24048 | 67658 | 1.04 | 3382 | 0.052 |
| 4 | 7097 | 18709 | 0.97 | 809 | 0.042 |
| 5 | 10755 | 28068 | 0.96 | 1188 | 0.041 |
| 6 | 65557 | 718489 | 4.03 | 12116 | 0.068 |
| 7 | 79245** | 536380 | 2.49 | 30592 | 0.142** |
| 8 | 69948 | 293733 | 1.55 | 14592 | 0.077 |
| 9 | 53305 | 189971 | 1.31 | 6580 | 0.045 |
| 10 | 34160 | 144982 | 1.56 | 8097 | 0.087 |
| 11 | 6577 | 11056 | 0.62 | 2884 | 0.161 |
| 12/66 | 3582 | 23195 | 2.38 | 1049 | 0.108 |
| 1/67 | 4360 | 11534 | 0.97 | 2036 | 0.172 |
| 2 | 7366 | 29742 | 1.49 | 1301 | 0.065 |
| 3 | 4908 | 21508 | 1.61 | 1030 | 0.077 |
| 4 | 361 | 1501 | 1.53 | 53 | 0.054 |
| 5 | 6585 | 33793 | 1.89 | 1474 | 0.082 |
| 6 | 19358 | 177688 | 3.38 | 3692 | 0.070 |
| 7 | 26855 | 117412 | 1.61 | 6212 | 0.085 |
| 8 | 23026 | 107384 | 1.72 | 4339 | 0.069 |
| 9 | 14162 | 54572 | 1.42 | 2563 | 0.067 |
| 10 | 43991 | 191587 | 1.60 | 12754 | 0.107 |
| 11 | 11770 | 17759 | 0.56 | 4891 | 0.153 |
| 12/67 | 7261 | 43155 | 2.19 | 2092 | 0.106 |
| 1/68 | 1708 | 6628 | 1.43 | 705 | 0.152 |
| 2 | 8053 | 43612 | 1.99 | 1917 | 0.088 |
| 3 | 4798 | 22501 | 1.73 | 1032 | 0.079 |
| 4 | 6608 | 30658 | 1.71 | 1229 | 0.068 |
| 5 | 23818 | 86863 | 1.34 | 3290 | 0.051 |
| 6 | 132712 | 2159063 | 5.99 | 29825 | 0.083 |
| 7 | 100332 | 611269 | 2.24 | 33005 | 0.121 |
| 8 | 37882 | 179336 | 1.74 | 8599 | 0.084 |
| 9 | 26971 | 107724 | 1.47 | 5030 | 0.069 |
| 10 | 69023 | 297536 | 1.59 | 16279 | 0.087 |
| 11 | 18000 | 37719 | 0.77 | 5376 | 0.110 |
| 12/68 | 2239** | 16369 | 2.69 | 657 | 0.108** |

(Continued)

| Date | Discharge (Ac-Ft) | TOTAL NITROGEN Loading (lbs) | TOTAL NITROGEN Concentrations (mg/l) | TOTAL PHOSPHORUS Loading (lbs) | TOTAL PHOSPHORUS Concentrations (mg/l) |
|---|---|---|---|---|---|
| 1/69 | 9985 | 28327 | 1.04 | 3415 | 0.126 |
| 2 | 7856 | 31102 | 1.46 | 1396 | 0.065 |
| 3 | 33832 | 110367 | 1.20 | 4698 | 0.051 |
| 4 | 9659 | 30788 | 1.17 | 1531 | 0.058 |
| 5 | 20823 | 62875 | 1.11 | 2362 | 0.042 |
| 6 | 47665 | 399477 | 3.08 | 7298 | 0.056 |
| 7 | 24440 | 174859 | 2.63 | 10974 | 0.165 |
| 8 | 33569 | 154609 | 1.69 | 7273 | 0.080 |
| 9 | 35024 | 127102 | 1.34 | 5426 | 0.057 |
| 10 | 83856 | 318891 | 1.40 | 14202 | 0.062 |
| 11 | 60444 | 152451 | 0.93 | 15859 | 0.097 |
| 12/69 | 35080 | 190077 | 1.99 | 7303 | 0.077 |
| 1/70 | 25989 | 85270 | 1.21 | 6787 | 0.096 |
| 2 | 31892 | 104106 | 1.20 | 4322 | 0.050 |
| 3 | 89462 | 255310 | 1.05 | 11236 | 0.046 |
| 4 | 54871 | 179205 | 1.20 | 7481 | 0.050 |
| 5 | 24561 | 109031 | 1.63 | 4294 | 0.064 |
| 6 | 58740 | 697910 | 4.37 | 12062 | 0.076 |
| 7 | 41712 | 248487 | 2.19 | 12952 | 0.114 |
| 8 | 43553 | 204308 | 1.73 | 10344 | 0.087 |
| 9 | 46100 | 176874 | 1.41 | 6258 | 0.050 |
| 10 | 33971 | 145045 | 1.57 | 7265 | 0.079 |
| 11 | 2660 | 4812 | 0.67 | 926 | 0.128 |
| 12/70 | 1898 | 14065 | 2.73 | 771 | 0.149 |
| 1/71 | 1712 | 8394 | 1.80 | 354 | 0.076 |
| 2 | 282 | 4081 | 5.32 | 286 | 0.373 |
| 3 | 5963 | 24799 | 1.53 | 875 | 0.054 |
| 4 | 3388 | 14271 | 1.55 | 510 | 0.055 |
| 5 | 3448 | 22502 | 2.40 | 952 | 0.102 |
| 6 | 11482 | 123265 | 3.95 | 2833 | 0.091 |
| 7 | 16187 | 123230 | 2.80 | 7866 | 0.178 |
| 8 | 11982 | 57561 | 1.77 | 2550 | 0.078 |
| 9 | 31884 | 121337 | 1.40 | 4988 | 0.058 |
| 10 | 10322 | 38023 | 1.36 | 2145 | 0.076 |
| 11 | 37897 | 65412 | 0.64 | 10639 | 0.103 |
| 12/71 | 11006 | 66683 | 2.23 | 2886 | 0.096 |

(Continued)

| Date | Discharge (Ac-Ft) | TOTAL NITROGEN Loading (lbs) | TOTAL NITROGEN Concentrations (mg/l) | TOTAL PHOSPHORUS Loading (lbs) | TOTAL PHOSPHORUS Concentrations (mg/l) |
|---|---|---|---|---|---|
| 1/72 | 9152 | 19548 | 0.79 | 3689 | 0.143 |
| 2 | 6857 | 17797 | 0.95 | 985 | 0.053 |
| 3 | 2971 | 15860 | 1.96 | 749 | 0.093 |
| 4 | 13013 | 38781 | 1.10 | 1715 | 0.048 |
| 5 | 48754 | 156094 | 1.18 | 5530 | 0.042 |
| 6 | 66905 | 1363338 | 7.50 | 16691 | 0.092 |
| 7 | 28806 | 200844 | 2.57 | 12536 | 0.160 |
| 8 | 19777 | 99936 | 1.86 | 4392 | 0.082 |
| 9 | 13224 | 56240 | 1.56 | 2744 | 0.076 |
| 10 | 6937 | 34076 | 1.81 | 2153 | 0.114 |
| 11 | 10451 | 16851 | 0.59 | 4372 | 0.154 |
| 12/72 | 5955 | 41133 | 2.54 | 1807 | 0.112 |
| 1/73 | 4225 | 15677 | 1.37 | 758 | 0.066 |
| 2 | 2908 | 10303 | 1.30 | 536 | 0.068 |
| 3 | 2410 | 12345 | 1.88 | 674 | 0.103 |
| 4 | 1303 | 6753 | 1.91 | 489 | 0.138 |
| 5 | 4026 | 20845 | 1.91 | 892 | 0.082 |
| 6 | 16969 | 291832 | 6.33 | 4725 | 0.102 |
| 7 | 50570 | 363053 | 2.64 | 23267 | 0.169 |
| 8 | 36716 | 168365 | 1.69 | 7632 | 0.076 |
| 9 | 49331 | 186296 | 1.39 | 8465 | 0.063 |
| 10 | 35305 | 159030 | 1.66 | 9753 | 0.102 |
| 11 | 9366 | 15871 | 0.62 | 3591 | 0.141 |
| 12/73 | 9370 | 54044 | 2.12 | 2324 | 0.091 |
| 1/74 | 29419 | 51079 | 0.64 | 9470 | 0.118 |
| 2 | 5712 | 15618 | 1.01 | 919 | 0.059 |
| 3 | 2045 | 6723 | 1.21 | 404 | 0.073 |
| 4 | 52 | 314 | 2.22 | 22 | 0.157 |
| 5 | 26 | 118 | 1.66 | 7 | 0.105 |
| 6 | 12993 | 145302 | 4.11 | 2436 | 0.069 |
| 7 | 34649 | 170027 | 1.81 | 8894 | 0.094 |
| 8 | 38658 | 184326 | 1.75 | 8527 | 0.081 |
| 9 | 23820 | 89207 | 1.38 | 4201 | 0.065 |
| 10 | 31432 | 137974 | 1.62 | 8334 | 0.098 |
| 11 | 13014 | 37660 | 1.06 | 4353 | 0.123 |
| 12/74 | 13153 | 91919 | 2.57 | 3770 | 0.105 |

Plan Scenario Land Uses West Palm Beach Backpumping
Alternative West C-51 Plus L-8 Basins

| Date | Discharge (Ac-Ft) | TOTAL NITROGEN Loading (lbs) | TOTAL NITROGEN Concentrations (mg/1) | TOTAL PHOSPHORUS Loading (lbs) | TOTAL PHOSPHORUS Concentrations (mg/1) |
|---|---|---|---|---|---|
| 1/63 | 4073 | 10819 | 0.98 | 2578 | 0.233 |
| 2 | 9990 | 27152 | 1.00 | 2632 | 0.097 |
| 3 | 9192 | 27455 | 1.10 | 2509 | 0.100 |
| 4 | 1323 | 5501 | 1.53 | 194 | 0.054 |
| 5 | 16794 | 74212 | 1.63 | 5026 | 0.110 |
| 6 | 13629 | 192409 | 5.19 | 4119 | 0.111 |
| 7 | 4400 | 29365 | 2.46 | 2337 | 0.195 |
| 8 | 11083 | 51760 | 1.72 | 3547 | 0.118 |
| 9 | 29603 | 117218 | 1.46 | 6467 | 0.080 |
| 10 | 30108 | 142452 | 1.74 | 9974 | 0.121 |
| 11 | 11261 | 22462 | 0.73 | 5375 | 0.176 |
| 12/63 | 13184 | 64761 | 1.81 | 4854 | 0.135 |
| 1/64 | 24713 | 65274 | 0.97 | 8240 | 0.123 |
| 2 | 16980 | 51491 | 1.12 | 3274 | 0.071 |
| 3 | 6921 | 23705 | 1.26 | 2259 | 0.120 |
| 4 | 9382 | 32188 | 1.26 | 2766 | 0.108 |
| 5 | 10440 | 37641 | 1.33 | 2189 | 0.077 |
| 6 | 25264 | 312101 | 4.55 | 5683 | 0.083 |
| 7 | 15009 | 129814 | 3.18 | 9757 | 0.239 |
| 8 | 29082 | 119764 | 1.52 | 6771 | 0.086 |
| 9 | 39177 | 159120 | 1.49 | 7854 | 0.074 |
| 10 | 42912 | 167176 | 1.43 | 8785 | 0.075 |
| 11 | 34904 | 89412 | 0.94 | 11004 | 0.116 |
| 12/64 | 27050 | 148741 | 2.02 | 6715 | 0.091 |
| 1/65 | 12251 | 42889 | 1.29 | 4029 | 0.121 |
| 2 | 7861 | 30419 | 1.42 | 2513 | 0.118 |
| 3 | 6886 | 28897 | 1.54 | 1874 | 0.100 |
| 4 | 1934 | 13886 | 2.64 | 1366 | 0.260 |
| 5 | 233 | 2250 | 3.55 | 282 | 0.445 |
| 6 | 27773* | 156142 | 2.07 | 5908 | 0.078 |
| 7 | 44410 | 293381 | 2.43 | 19230 | 0.159 |
| 8 | 37180 | 179332 | 1.77 | 9390 | 0.093 |
| 9 | 19416 | 76193 | 1.44 | 4312 | 0.102 |
| 10 | 80691 | 315271 | 1.44 | 17733 | 0.081 |
| 11 | 67360 | 137639 | 0.75 | 21993 | 0.120 |
| 12/65 | 16804 | 101721 | 2.23 | 6084 | 0.133 |

Table (Continued)

| Date | Discharge (Ac-Ft) | TOTAL NITROGEN Loading (lbs) | TOTAL NITROGEN Concentrations (mg/1) | TOTAL PHOSPHORUS Loading (lbs) | TOTAL PHOSPHORUS Concentrations (mg/1) |
|---|---|---|---|---|---|
| 1/66 | 31970 | 94744 | 1.09 | 9370 | 0.108 |
| 2 | 34108 | 103843 | 1.12 | 5217 | 0.056 |
| 3 | 27164 | 73564 | 1.00 | 4693 | 0.064 |
| 4 | 10996 | 34509 | 1.15 | 2512 | 0.084 |
| 5 | 14648 | 43367 | 1.09 | 2748 | 0.069 |
| 6 | 74105 | 903926 | 4.49 | 15267 | 0.076 |
| 7 | 85262* | 585099 | 2.52 | 34796 | 0.150** |
| 8 | 75068 | 316086 | 1.55 | 16430 | 0.081 |
| 9 | 58681 | 205996 | 1.29 | 7944 | 0.050 |
| 10 | 37005 | 155798 | 1.55 | 9694 | 0.096 |
| 11 | 8102 | 16080 | 0.73 | 4384 | 0.199 |
| 12/66 | 5086 | 35746 | 2.59 | 2314 | 0.167 |
| 1/67 | 4683 | 15981 | 1.26 | 3419 | 0.269 |
| 2 | 10552 | 44883 | 1.57 | 2899 | 0.101 |
| 3 | 5826 | 26417 | 1.67 | 2318 | 0.146 |
| 4 | 361 | 1501 | 1.53 | 53 | 0.054 |
| 5 | 6416 | 26679 | 1.53 | 942 | 0.054 |
| 6 | 27040 | 359049 | 4.89 | 8190 | 0.111 |
| 7 | 32401 | 162557 | 1.85 | 9663 | 0.110 |
| 8 | 25524 | 121016 | 1.74 | 6118 | 0.088 |
| 9 | 18755 | 72217 | 1.42 | 4425 | 0.087 |
| 10 | 49638 | 226218 | 1.68 | 15008 | 0.111 |
| 11 | 12685 | 20832 | 0.60 | 5960 | 0.173 |
| 12/67 | 8992 | 62679 | 2.56 | 3989 | 0.163 |
| 1/68 | 1725 | 8298 | 1.77 | 1131 | 0.241 |
| 2 | 11145 | 52756 | 1.74 | 3832 | 0.127 |
| 3 | 6973 | 25919 | 1.37 | 1861 | 0.098 |
| 4 | 6819 | 33832 | 1.83 | 2188 | 0.118 |
| 5 | 29420 | 116738 | 1.46 | 5450 | 0.068 |
| 6 | 137670 | 2236435 | 5.98 | 31803 | 0.085 |
| 7 | 104003 | 632248 | 2.24 | 35354 | 0.125 |
| 8 | 40941 | 190781 | 1.71 | 10013 | 0.090 |
| 9 | 31018 | 124871 | 1.48 | 6776 | 0.080 |
| 10 | 71975 | 315826 | 1.61 | 18017 | 0.092 |
| 11 | 18565 | 41513 | 0.82 | 6107 | 0.121 |
| 12/68 | 1999* | 14614 | 2.69 | 587 | 0.108 ** |

Table E. (Continued)

| Date | Discharge (Ac-Ft) | TOTAL NITROGEN Loading (lbs) | TOTAL NITROGEN Concentrations (mg/l) | TOTAL PHOSPHORUS Loading (lbs) | TOTAL PHOSPHORUS Concentrations (mg/l) |
|---|---|---|---|---|---|
| 1/69 | 10328 | 40781 | 1.45 | 5634 | 0.201 |
| 2 | 9304 | 43386 | 1.72 | 3189 | 0.126 |
| 3 | 37305 | 129794 | 1.28 | 6789 | 0.067 |
| 4 | 9828 | 37186 | 1.39 | 2830 | 0.106 |
| 5 | 25034 | 91716 | 1.35 | 4323 | 0.064 |
| 6 | 57611 | 637607 | 4.07 | 11506 | 0.073 |
| 7 | 26726 | 193486 | 2.66 | 12948 | 0.178 |
| 8 | 37523 | 174593 | 1.71 | 8867 | 0.087 |
| 9 | 39723 | 152590 | 1.41 | 7570 | 0.070 |
| 10 | 87829 | 339259 | 1.42 | 16186 | 0.068 |
| 11 | 62226 | 164155 | 0.97 | 17569 | 0.104 |
| 12/69 | 36664 | 202411 | 2.03 | 8177 | 0.082 |
| 1/70 | 28896 | 95122 | 1.21 | 9451 | 0.120 |
| 2 | 33505 | 109078 | 1.20 | 5073 | 0.056 |
| 3 | 95065 | 262635 | 1.02 | 12858 | 0.050 |
| 4 | 56230 | 181797 | 1.19 | 7943 | 0.052 |
| 5 | 27505 | 119816 | 1.60 | 6464 | 0.086 |
| 6 | 63436 | 789243 | 4.58 | 13905 | 0.081 |
| 7 | 46328 | 284430 | 2.26 | 16186 | 0.129 |
| 8 | 45486 | 214838 | 1.74 | 11624 | 0.094 |
| 9 | 51867 | 199477 | 1.42 | 8420 | 0.060 |
| 10 | 36769 | 158025 | 1.58 | 8931 | 0.089 |
| 11 | 2134 | 4226 | 0.73 | 712 | 0.123 |
| 12/70 | 2635 | 24281 | 3.39 | 3035 | 0.424 |
| 1/71 | 2998 | 17127 | 2.10 | 1431 | 0.176 |
| 2 | 1513 | 11212 | 2.73 | 1596 | 0.388 |
| 3 | 6225 | 28620 | 1.69 | 1487 | 0.088 |
| 4 | 5295 | 34523 | 2.40 | 3167 | 0.220 |
| 5 | 6576 | 34523 | 1.93 | 2108 | 0.118 |
| 6 | 19324 | 292506 | 5.57 | 6045 | 0.115 |
| 7 | 21815 | 163399 | 2.76 | 11416 | 0.193 |
| 8 | 16151 | 79038 | 1.80 | 4455 | 0.101 |
| 9 | 35779 | 139098 | 1.43 | 6533 | 0.067 |
| 10 | 15716 | 63960 | 1.50 | 4804 | 0.112 |
| 11 | 39512 | 67458 | 0.63 | 11172 | 0.104 |
| 12/71 | 12246 | 80930 | 2.43 | 4883 | 0.147 |

(Continued)

| Date | Discharge (Ac-Ft) | TOTAL NITROGEN Loading (lbs) | TOTAL NITROGEN Concentrations (mg/l) | TOTAL PHOSPHORUS Loading (lbs) | TOTAL PHOSPHORUS Concentrations (mg/l) |
|---|---|---|---|---|---|
| 1/72 | 12599 | 29869 | 0.87 | 6008 | 0.175 |
| 2 | 9045 | 24666 | 1.00 | 1868 | 0.076 |
| 3 | 7034 | 36375 | 1.90 | 3179 | 0.166 |
| 4 | 18833 | 46370 | 0.91 | 3202 | 0.063 |
| 5 | 53486 | 166278 | 1.14 | 6787 | 0.047 |
| 6 | 70953 | 1419051 | 7.36 | 18064 | 0.094 |
| 7 | 31294 | 215712 | 2.54 | 14524 | 0.171 |
| 8 | 25217 | 124728 | 1.82 | 6298 | 0.092 |
| 9 | 15060 | 65034 | 1.59 | 3927 | 0.096 |
| 10 | 8050 | 39731 | 1.82 | 3253 | 0.149 |
| 11 | 11853 | 21733 | 0.67 | 5874 | 0.182 |
| 12/72 | 7060 | 50768 | 2.65 | 3428 | 0.179 |
| 1/73 | 7812 | 36540 | 1.72 | 3162 | 0.149 |
| 2 | 4677 | 17208 | 1.35 | 1498 | 0.118 |
| 3 | 4521 | 22383 | 1.82 | 2260 | 0.184 |
| 4 | 1437 | 10367 | 2.65 | 1571 | 0.402 |
| 5 | 4854 | 24338 | 1.84 | 1601 | 0.121 |
| 6 | 21794 | 394618 | 6.66 | 7400 | 0.125 |
| 7 | 55325 | 398188 | 2.65 | 26405 | 0.176 |
| 8 | 42418 | 194940 | 1.69 | 9747 | 0.085 |
| 9 | 54239 | 204643 | 1.39 | 10000 | 0.068 |
| 10 | 39804 | 178768 | 1.65 | 11773 | 0.109 |
| 11 | 9943 | 20626 | 0.76 | 4765 | 0.176 |
| 12/73 | 11672 | 74986 | 2.36 | 4159 | 0.131 |
| 1/74 | 30489 | 63453 | 0.77 | 10824 | 0.131 |
| 2 | 6460 | 18224 | 1.04 | 1712 | 0.098 |
| 3 | 3215 | 19535 | 2.24 | 2166 | 0.248 |
| 4 | 637 | 6082 | 3.51 | 787 | 0.455 |
| 5 | 1950 | 16336 | 3.08 | 1818 | 0.343 |
| 6 | 18416 | 284145 | 5.68 | 5693 | 0.114 |
| 7 | 42994 | 249628 | 2.14 | 14759 | 0.126 |
| 8 | 42834 | 206048 | 1.77 | 10152 | 0.087 |
| 9 | 29062 | 116685 | 1.48 | 6551 | 0.083 |
| 10 | 33336 | 148533 | 1.64 | 9296 | 0.103 |
| 11 | 14721 | 33376 | 1.11 | 6463 | 0.162 |
| 12/74 | 13814 | 95864 | 2.55 | 4451 | 0.119 |

Exhibit 7.6: Input Set For C-4 Basin

```
H2  .156     .129     .082
J1 3.483    .3483    .0218     .0254.0001052
T1     0
T2   0.0        1                        2
T3.00001

A1                      WEST TAMIAMI(C-4) PATTERN SCENARIO
A2          JAY G FOY  CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3          SCENARIO LAND USE- URBAN,             BOD,N,P, -  CIMP=0.658
B1       1        0        1        0        1        0
B2      10        1        1   621109       13
C1 MIAMI WSO AP                             11           630101   750531        1
E1 C-4WEST                 5      4.6  .000001
E224870.       .10      .658       1.        0
E3      .1     .104     .048     .078     .169     .182     .213     .216     .219     .200
E3    .156     .129     .082
F1SINGLE     73.73       35.     100.     9999
F2   10.   .000001  .000001    0.446    .0562  .001249
F1MULTPL      4.11       65.     100.     9999
F2   10.   .000001  .000001    1.055    .2341  .004088
F1COMMCL      5.49       85.     100.     9999
F2   10.   .000001  .000001    4.478    .3122   .01137
F1INDSTL     13.90       61.     100.     9999
F2   10.   .000001  .000001    1.758    .4948  .007353
F1OPEN        2.77        5.     100.     9999
#1OPEN        2.77        5.     100.     9999
F2   10.   .000001   000001     .122    .0758.0002604
H1.00001       .10        1.        0                               .46
H2       3    .104     .048     .078     .169     .182     .213     .216     .219     .200
H2    .156    .129     .082
J1 3.483     .3483    .0218     .0254.0001052
T1     0
T2   0.0        1                        2
T3.00001

C-4WEST          237.       100.       177.       373.       415.       470.       493.
C-4WEST          499.       442.       355.       285.       187.           SWETH
C-4WEST          418.       176.       312.       657.       729.       826.       868.
C-4WEST          878.       777.       625.       502.       329.           SWETF
  .145
C-4WEST 63      7395.     11352.      8977.      3342.      3866.     12117.      3991.
C-4WEST 63      5522.     15955.     19458.      6643.      5465.           DISH
C-4WEST 64      8545.      4824.      3852.      3362.      1734.     11631.     11486.
C-4WEST 64      9666.      7498.     10146.      9545.     12141.           DISH
C-4WEST 65      8216.     14450.     13309.      5355.      3422.      4229.      8309.
C-4WEST 65      4249.      8265.     17217.     14874.      9588.           DISH
C-4WEST 66     12181.      8725.      9198       7367.      7531.     17693.     19101.
#-4WEST 66     12181.      8725.      9198.      7367.      7531      17693.   .  19101.
C-4WEST 66     15743.     18697.     18345.     13732.      8934.           DISH
C-4WEST 67      8249.      7242.      6312.      4939.      2840.     11742.     13046.
C-4WEST 67      8926.      6145.     12476.      8420.      6653.           DISH
C-4WEST 68     14051.     13688.     11437.      6442.     24691.     46761.     39113.
C-4WEST 68     27829.     32577.     43560.     25103.     17239.           DISH
C-4WEST 69     21166.     14837.     11978.     12137.     22864.     44260.     27686.
C-4WEST 69     30843.     25849.     31742.     33831.     21323.           DISH
C-4WEST 70     18651.     14706.     13843.     14813.     17911.     29060.     22967.
C-4WEST 70     22834.     32139.     25754.     17191.     13528.           DISH
C-4WEST 71     11742.      8057.      6990.      3054.      4473.     10707.      9398.
C-4WEST 71     11351.     29574.     25001.     20053.     23495.           DISH
C-4WEST 72     11016.      9765.      9057.      9323.     23497.     22350.     20864.
```

```
C-4WEST 72   28866.   25482.   17530.   25068.   13633.          DISH
C-4WEST 73   12492.    9674.    8011.    4996.    3848.    5836.     18211.
I-4WEST 73   12492.    9674.    8011.    4996.    3848.    5836.     18211.
C-4WEST 73   25813.   31276.   20494.   13520.   11941.          DISH
C-4WEST 74   11935.    8291.    5639.    5996.    4965.    5740.     14464.
C-4WEST 74   22120.   18332.   18766.   14339.   15840.          DISH
C-4WEST 75    8150.    5890.    4920.    6217.    7060.      0.         0.
C-4WEST 75       0.       0.       0.       0.       0.          DISH

C-4WEST
C-4WEST                                                          ONPSCSS
C-4WEST
C-4WEST                                                          ONPSCBOD
C-4WEST         1.33     1.30     1.08     1.10     1.22    0.96      1.91
C-4WEST         2.05     1.37     1.78     1.94     1.16          ONPSCN
C-4WEST         .016     .084     .080     .007     .009    .034      .012
C-4WEST         .014     .014     .021     .008     .001          ONPSCP
C-4WEST          .0       .0      .147     .147                   REFF

        AJYQJYE.   77/02/19.FLORIDA STATE UNIVERSITY KRONOS

16.12.10.JGF,T550,CM120000,MO    FOY
16.12.11.ACCOUNT,9364003,.
16.12.11.STAGEI,RI1098,7782/+2.TAPE11.
16.14.18.MT51, ASSIGNED TO STAGEIN, VSN=****51.
16.14.24. STAGING COMPLETE.
16.14.24.CALL,PROG3.
16.14.24.CALL,PROG3.
16.14.25.CBP,,CARDS.
16.14.25. COPY COMPLETE.
16.14.25.CBR,,CARD2.
16.14.25. COPY COMPLETE.
16.14.25.CBR,,IP1.
16.14.25. COPY COMPLETE.
16.14.26.CBR,,IP2.
16.14.26. COPY COMPLETE.
16.14.26.CBR,,IP3.
16.14.26. COPY COMPLETE.
16.14.26.G,STORM,SUMMB.
16.14.28.CALL (PROG2(LFN=LAND,NAME=IP1)
16.14.28.RA,INPUT.
16.14.28.ASSIGN.MS.OUTPUT.
16.14.28.DI00, ASSIGNED TO OUTPUT.
16.14.29.STORM(IP1)
16.16.17.STOP
16.16.17.RENAME,QUAL=TAPE13.
16.16.17.RENAME,OUT=OUTPUT.
16.16.17.RA,INPUT.
16.16.17.SUMMB.
16.17.15.STOP
16.17.15.RENAME,LAND=QUALSUM.
16.17.15.DISPOSE,QUAL=PR/EI=9364003.
16.17.15.RT,OUT.
16.17.15.CALL (PROG2(LFN=SCENAR,NAME=IP2)
16.17.16.RA,INPUT.
16.17.16.ASSIGN.MS.OUTPUT.
16.17.16.DI00, ASSIGNED TO OUTPUT.
```

Exhibit 7.7: CLADM Hydrologic Output for Western C-4 Using 1973-74 Land Uses and Planned Scenario.

## WEST TAMIAMI

| | | 73-74 LAND USES | | | | | | * | SCENARIO LAND USES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RAINFALL | DISCHARGE | RUNOFF | SWET | DSET | NGWL | NGWL | RUNOFF | DSET | SWET | DISCHARGE |
| 63 | 1 | 2169 | 7395 | 100 | 237 | 1615 | -7078 | -8104 | 167 | 1487 | 418 | 8368 |
| ■3 | 1 | 2169 | 7395 | 100 | 237 | 1615 | -7078 | -8104 | 167 | 1487 | 418 | 8368 |
| 63 | 2 | 11515 | 11352 | 1669 | 100 | 2279 | -2216 | -2537 | 2370 | 1831 | 176 | 12045 |
| 63 | 3 | 2436 | 8977 | 234 | 177 | 1143 | -7861 | -9001 | 367 | 936 | 312 | 10189 |
| 63 | 4 | 1101 | 3342 | 33 | 373 | 917 | -3531 | -4043 | 67 | 829 | 657 | 3658 |
| 63 | 5 | 21160 | 3866 | 3104 | 415 | 3982 | 12897 | 11264 | 4272 | 3702 | 729 | 5465 |
| 63 | 6 | 22696 | 12117 | 2837 | 470 | 6995 | 3114 | 2720 | 4005 | 6328 | 826 | 12822 |
| 63 | 7 | 5908 | 3991 | 501 | 493 | 3137 | -1713 | -1961 | 734 | 2907 | 868 | 4094 |
| 63 | 8 | 15920 | 5522 | 1969 | 499 | 5022 | 4877 | 4259 | 2737 | 4736 | 878 | 6047 |
| 63 | 9 | 37114 | 15955 | 5574 | 442 | 6267 | 14450 | 12620 | 7643 | 5880 | 777 | 17837 |
| 63 | 10 | 14785 | 19458 | 1969 | 355 | 3888 | -8916 | -10209 | 2770 | 3465 | 625 | 20904 |
| 63 | 11 | 4773 | 6643 | 501 | 285 | 2002 | -4157 | -4760 | 701 | 1908 | 502 | 7123 |
| 63 | 12 | 14218 | 5465 | 2236 | 187 | 1842 | 6724 | 5872 | 3104 | 1533 | 329 | 6484 |
| | | 153795 | 104083 | 20727 | 4033 | 39089 | 6590 | -3880 | 28937 | 35542 | 7097 | 115036 |
| ■ | | 153795 | 104083 | 20727 | 4033 | 39089 | 6590 | -3880 | 28937 | 35542 | 7097 | 115036 |
| 64 | 1 | 1502 | 8545 | 167 | 237 | 578 | -7858 | -8997 | 234 | 547 | 418 | 9534 |
| 64 | 2 | 7376 | 4824 | 968 | 100 | 2019 | 433 | 378 | 1368 | 1784 | 176 | 5038 |
| 64 | 3 | 1669 | 3852 | 100 | 177 | 1115 | -3475 | -3979 | 167 | 987 | 312 | 4349 |
| 64 | 4 | 11047 | 3362 | 1469 | 373 | 2920 | 4392 | 3836 | 2003 | 2864 | 657 | 3690 |
| 64 | 5 | 15587 | 1734 | 2136 | 415 | 3765 | 9673 | 8448 | 2937 | 3584 | 729 | 2826 |
| 64 | 6 | 34978 | 11631 | 5173 | 470 | 6348 | 16529 | 14436 | 7009 | 6335 | 826 | 13381 |
| 64 | 7 | 18390 | 11486 | 2103 | 493 | 6753 | -342 | -392 | 3004 | 6115 | 868 | 11799 |
| 64 | 8 | 32842 | 9666 | 5040 | 499 | 4950 | 17727 | 15482 | 6875 | 4745 | 878 | 11737 |
| 64 | 9 | 14085 | 7498 | 1669 | 442 | 4849 | 1296 | 1132 | 2403 | 4264 | 777 | 7912 |
| 64 | 10 | 32608 | 10146 | 5073 | 355 | 4532 | 17575 | 15349 | 6976 | 4102 | 625 | 12532 |
| 64 | 11 | 10013 | 9545 | 1335 | 285 | 2624 | -2441 | -2795 | 1902 | 2238 | 502 | 10068 |
| 64 | 12 | 20827 | 12141 | 3504 | 187 | 1432 | 7067 | 6172 | 4806 | 1186 | 329 | 13140 |
| ■4 | 12 | 20827 | 12141 | 3504 | 187 | 1432 | 7067 | 6172 | 4806 | 1186 | 329 | 13140 |
| | | 200924 | 94430 | 28737 | 4033 | 41885 | 60576 | 49070 | 39684 | 38751 | 7097 | 106006 |
| 65 | 1 | 6608 | 8216 | 634 | 237 | 3099 | -4944 | -5661 | 968 | 2653 | 418 | 9198 |
| 65 | 2 | 9946 | 14450 | 1402 | 100 | 2188 | -6792 | -7777 | 1936 | 2035 | 176 | 15512 |
| 65 | 3 | 13250 | 13309 | 2003 | 177 | 2168 | -2404 | -2753 | 2804 | 1793 | 312 | 13898 |
| 65 | 4 | 4005 | 5355 | 567 | 373 | 865 | -2588 | -2963 | 768 | 868 | 657 | 5443 |
| 65 | 5 | 1469 | 3422 | 67 | 415 | 1099 | -3467 | -3970 | 167 | 787 | 729 | 3923 |
| 65 | 6 | 21861 | 4229 | 2970 | 470 | 5422 | 11740 | 10253 | 4205 | 4676 | 826 | 6106 |
| 65 | 7 | 21895 | 8309 | 2770 | 493 | 6564 | 6529 | 5702 | 3905 | 5936 | 868 | 9389 |
| 65 | 8 | 16588 | 4249 | 2003 | 499 | 5505 | 6335 | 5533 | 2904 | 4722 | 878 | 5455 |
| 65 | 9 | 37982 | 8265 | 5607 | 442 | 6950 | 22325 | 19498 | 7877 | 5793 | 777 | 11914 |
| 65 | 10 | 56038 | 17217 | 9245 | 355 | 4873 | 33593 | 29339 | 12683 | 4208 | 625 | 21866 |
| 65 | 11 | 3204 | 14874 | 200 | 285 | 2096 | -14051 | -16088 | 334 | 1840 | 502 | 16950 |
| ■5 | 11 | 3204 | 14874 | 200 | 285 | 2096 | -14051 | -16088 | 334 | 1840 | 502 | 16950 |
| 65 | 12 | 2069 | 9588 | 167 | 187 | 1146 | -8852 | -10136 | 267 | 978 | 329 | 10898 |
| | | 194915 | 111483 | 27635 | 4033 | 41975 | 37424 | 20978 | 38818 | 36289 | 7097 | 130551 |
| 66 | 1 | 13250 | 12181 | 1802 | 237 | 3276 | -2444 | -2798 | 2470 | 3157 | 418 | 12473 |
| 66 | 2 | 21895 | 8725 | 3771 | 100 | 1022 | 12048 | 10522 | 5173 | 754 | 176 | 10443 |
| 66 | 3 | 10847 | 9198 | 1602 | 177 | 1981 | -509 | -583 | 2236 | 1709 | 312 | 9409 |
| 66 | 4 | 6008 | 7367 | 801 | 373 | 1575 | -3307 | -3787 | 1168 | 1234 | 657 | 7904 |
| 66 | 5 | 18457 | 7531 | 2637 | 415 | 3865 | 6646 | 5804 | 3638 | 3590 | 729 | 8334 |
| 66 | 6 | 71324 | 17693 | 11214 | 470 | 9261 | 43900 | 38341 | 15320 | 8719 | 826 | 23438 |

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MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW
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A1                               TAMIAMI CANAL BASIN
A2         JAY G FOY  CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3                    73-74 LAND USES   WEST TAMIAMI
#3                    73-74 LAND USES   WEST TAMIAMI
B1      1       0       1       0       1       0
B2     10       1       1  621109      13
C1 MIAMI WSO AP                        11            630101  750531        1
E1 C-4WEST              5     4.6  .000001
E213843.     .10       .9      1.       0
E3   .10    .104     .048    .078    .169    .182    .213    .216    .219    .200
E3  .156    .129     .082
F1SINGLE   55.75      34.     100.  9999999
F2   10.  .000001  .000001   0.446   .0562  .001249
F1MULTPL    6.17     79.6     100.  9999999
F2   10.  .000001  .000001   1.055   .2341  .004088
F1COMMCL    1.03      85.     100.  9999999
F2   10.  .000001  .000001   4.478   .3122   .01137
F1INDSTL   10.05    30.75     100.  9999999
F2   10.  .000001  .000001   1.758   .4948  .007353
F1OPEN     27.00       5.     100.  9999999
F2   10.  .000001  .000001    .122   .0758.0002604
H126208.     .10      1.0                                         .46
H2   .24    .104     .048    .078    .169    .182    .213    .216    .219    .200
H2  .156    .129     .082
J1 1.993   .1993    .0244   .0168.0000774
T1     0
T2   0.0       1                        2
T3.00001
#3.00001

A1                        WEST TAMIAMI(C-4) PATTERN SCENARIO
A2         JAY G FOY  CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3         SCENARIO LAND USE-                    BOD,N,P, -  CIMP=0.658
B1      1       0       1       0       1       0
B2     10       1       1  621109      13
C1 MIAMI WSO AP                        11            630101  750531        1
E1 C-4WEST              5     4.6  .000001
E224870.     .10     .658      1.       0
E3     1    .104     .048    .078    .169    .182    .213    .216    .219    .200
E3  .156    .129     .082
F1SINGLE   73.73      35.     100.     9999
F2   10.  .000001  .000001   0.446   .0562  .001249
F1MULTPL    4.11      65.     100.     9999
F2   10.  .000001  .000001   1.055   .2341  .004088
F1COMMCL    5.49      85.     100      9999
F2   10.  .000001  .000001   4.478   .3122   .01137
F1INDSTL   13.90      61.     100.     9999
F2   10.  .000001  .000001   1.758   .4948  .007353
F1OPEN      2.77       5.     100.     9999
F2   10.  .000001  .000001     122    0758.0002604
H115181.     .10       1.       0                                 .46
H2    .3    .104     .048    .078    .169    .182    .213    .216    .219    .200
#2    .3    .104     .048    .078    .169    .182    .213    .216    .219    .200
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| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66 | 7 | 28369 | 19101 | 3671 | 493 | 8051 | 724 | 632 | 5173 | 7228 | 868 | 19641 |
| 66 | 8 | 25432 | 15743 | 3404 | 499 | 6592 | 2598 | 2269 | 4806 | 5792 | 878 | 16493 |
| 66 | 9 | 26701 | 18697 | 3471 | 442 | 7491 | 71 | 62 | 4839 | 6924 | 777 | 18938 |
| 66 | 10 | 36313 | 18345 | 5674 | 355 | 4912 | 12701 | 11093 | 7877 | 4124 | 625 | 20471 |
| ■6 | 10 | 36313 | 18345 | 5674 | 355 | 4912 | 12701 | 11093 | 7877 | 4124 | 625 | 20471 |
| 66 | 11 | 12816 | 13732 | 1802 | 285 | 2842 | -4043 | -4629 | 2470 | 2723 | 502 | 14220 |
| 66 | 12 | 2470 | 8934 | 234 | 187 | 1177 | -7828 | -8963 | 334 | 1106 | 329 | 9998 |
| | | 273882 | 157247 | 40083 | 4033 | 52045 | 60557 | 47963 | 55504 | 47060 | 7097 | 171762 |
| 67 | 1 | 9178 | 8249 | 1135 | 237 | 2898 | -2206 | -2526 | 1602 | 2631 | 418 | 8655 |
| 67 | 2 | 3805 | 7242 | 334 | 100 | 1958 | -5495 | -6292 | 501 | 1759 | 176 | 8162 |
| 67 | 3 | 12015 | 6312 | 1635 | 177 | 2964 | 2562 | 2238 | 2336 | 2468 | 312 | 6997 |
| 67 | 4 | 501 | 4939 | 33 | 373 | 316 | -5127 | -5870 | 33 | 364 | 657 | 5350 |
| 67 | 5 | 5607 | 2840 | 768 | 415 | 1359 | 993 | 867 | 1068 | 1243 | 729 | 2768 |
| 67 | 6 | 53335 | 11742 | 8077 | 470 | 8634 | 32489 | 28375 | 11047 | 8188 | 826 | 15946 |
| 67 | 7 | 18524 | 13046 | 2503 | 493 | 4670 | 315 | 275 | 3471 | 4339 | 868 | 13042 |
| 67 | 8 | 27135 | 8926 | 3538 | 499 | 7555 | 10155 | 8869 | 5006 | 6675 | 878 | 10713 |
| 67 | 9 | 30639 | 6145 | 4572 | 442 | 5334 | 18718 | 16348 | 6341 | 4724 | 777 | 8790 |
| ■7 | 9 | 30639 | 6145 | 4572 | 442 | 5334 | 18718 | 16348 | 6341 | 4724 | 777 | 8790 |
| 67 | 10 | 42988 | 12476 | 6775 | 355 | 5492 | 24665 | 21541 | 9278 | 5071 | 625 | 15751 |
| 67 | 11 | 12716 | 8420 | 1736 | 285 | 3111 | 900 | 786 | 2436 | 2759 | 502 | 8669 |
| 67 | 12 | 4572 | 6653 | 601 | 187 | 1248 | -3516 | -4026 | 834 | 1163 | 329 | 7106 |
| | | 221015 | 96990 | 31707 | 4033 | 45539 | 74453 | 60585 | 43953 | 41384 | 7097 | 111949 |
| 68 | 1 | 6408 | 14051 | 768 | 237 | 2160 | -10040 | -11496 | 1101 | 1907 | 418 | 15579 |
| 68 | 2 | 9245 | 13688 | 1235 | 100 | 2411 | -6954 | -7962 | 1769 | 2016 | 176 | 15015 |
| 68 | 3 | 2937 | 11437 | 267 | 177 | 1459 | -10136 | -11606 | 367 | 1437 | 312 | 12794 |
| 68 | 4 | 4239 | 6442 | 567 | 373 | 1099 | -3675 | -4208 | 834 | 829 | 657 | 6961 |
| 68 | 5 | 61879 | 24691 | 9712 | 415 | 8128 | 28645 | 25017 | 13183 | 8003 | 729 | 28130 |
| 68 | 6 | 74628 | 46761 | 11815 | 470 | 9241 | 18156 | 15857 | 16121 | 8750 | 826 | 49195 |
| 68 | 7 | 20526 | 39113 | 2603 | 493 | 6119 | -25199 | -28853 | 3605 | 5796 | 868 | 42715 |
| 68 | 8 | 27835 | 27829 | 3972 | 499 | 5855 | -6348 | -7268 | 5641 | 4785 | 878 | 29440 |
| ■8 | 8 | 27835 | 27829 | 3972 | 499 | 5855 | -6348 | -7268 | 5641 | 4785 | 878 | 29440 |
| 68 | 9 | 37081 | 32577 | 5841 | 442 | 4756 | -694 | -795 | 8110 | 3937 | 777 | 33162 |
| 68 | 10 | 29070 | 43560 | 4038 | 355 | 6720 | -21565 | -24692 | 5540 | 6429 | 625 | 46708 |
| 68 | 11 | 4038 | 25103 | 434 | 285 | 1637 | -22987 | -26320 | 567 | 1720 | 502 | 28136 |
| 68 | 12 | 434 | 17239 | 0 | 187 | 434 | -17426 | -19953 | 33 | 297 | 329 | 19761 |
| | | 278320 | 302491 | 41252 | 4033 | 50019 | -78223 | -102278 | 56871 | 45906 | 7097 | 327595 |
| 69 | 1 | 22228 | 21166 | 3438 | 237 | 3203 | -2378 | -2723 | 4739 | 2860 | 418 | 21673 |
| 69 | 2 | 6742 | 14837 | 1135 | 100 | 462 | -8657 | -9912 | 1535 | 468 | 176 | 16010 |
| 69 | 3 | 6608 | 11978 | 734 | 177 | 2545 | -8092 | -9265 | 1068 | 2244 | 312 | 13317 |
| 69 | 4 | 15453 | 12137 | 2136 | 373 | 3631 | -688 | -788 | 3004 | 3178 | 657 | 12406 |
| 69 | 5 | 26767 | 22864 | 3872 | 415 | 5341 | -1853 | -2122 | 5307 | 5081 | 729 | 23079 |
| 69 | 6 | 38115 | 44260 | 5474 | 470 | 7823 | -14438 | -16532 | 7476 | 7563 | 826 | 46258 |
| 69 | 7 | 28303 | 27686 | 3738 | 493 | 7615 | -7491 | -8577 | 5240 | 6889 | 868 | 29123 |
| ■9 | 7 | 28303 | 27686 | 3738 | 493 | 7615 | -7491 | -8577 | 5240 | 6889 | 868 | 29123 |
| 69 | 8 | 14385 | 30843 | 1535 | 499 | 5888 | -22845 | -26158 | 2270 | 5110 | 878 | 34555 |
| 69 | 9 | 27502 | 25849 | 3872 | 442 | 6075 | -4864 | -5569 | 5273 | 5951 | 777 | 26343 |
| 69 | 10 | 45291 | 31742 | 7142 | 355 | 5763 | 7431 | 6490 | 9812 | 5191 | 625 | 32985 |
| 69 | 11 | 3371 | 33831 | 167 | 285 | 2447 | -33192 | -38005 | 300 | 2143 | 502 | 38731 |
| 69 | 12 | 3838 | 21323 | 567 | 187 | 698 | -18370 | -21034 | 768 | 701 | 329 | 23842 |
| | | 238603 | 298516 | 33810 | 4033 | 51491 | -115437 | -134194 | 46792 | 47379 | 7097 | 318321 |
| 70 | 1 | 8811 | 18651 | 1101 | 237 | 2716 | -12793 | -14648 | 1635 | 2128 | 418 | 20913 |
| 70 | 2 | 5908 | 14706 | 801 | 100 | 1474 | -10372 | -11876 | 1101 | 1407 | 176 | 16201 |
| 70 | 3 | 8711 | 13843 | 1101 | 177 | 2616 | -7925 | -9074 | 1635 | 2028 | 312 | 15445 |
| 70 | 4 | 3171 | 14813 | 467 | 373 | 585 | -12600 | -14427 | 634 | 579 | 657 | 16362 |
| 70 | 5 | 36647 | 17911 | 5941 | 415 | 3768 | 14553 | 12710 | 8177 | 3230 | 729 | 19978 |
| 70 | 6 | 18457 | 29060 | 2436 | 470 | 4973 | -16046 | -18373 | 3471 | 4272 | 826 | 31732 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 6 | 18457 | 29060 | 2436 | 470 | 4973 | -16046 | -18373 | 3471 | 4272 | 826 | 31732 |
| 70 | 7 | 14952 | 22967 | 1702 | 493 | 5532 | -14040 | -16076 | 2370 | 5268 | 868 | 24892 |
| 70 | 8 | 12015 | 22834 | 1402 | 499 | 4257 | -15575 | -17833 | 2069 | 3559 | 878 | 25411 |
| 70 | 9 | 29671 | 32139 | 4072 | 442 | 7136 | -10046 | -11503 | 5674 | 6484 | 777 | 33913 |
| 70 | 10 | 10046 | 25754 | 868 | 355 | 5244 | -21307 | -24397 | 1302 | 4727 | 625 | 29091 |
| 70 | 11 | 300 | 17191 | 0 | 285 | 0 | -17176 | -19667 | 0 | 0 | 502 | 19465 |
| 70 | 12 | 567 | 13528 | 0 | 187 | 567 | -13715 | -15704 | 0 | 567 | 329 | 15375 |
| | | 149256 | 243397 | 19891 | 4033 | 38868 | -137042 | -160866 | 28068 | 34249 | 7097 | 268776 |
| 71 | 1 | 1702 | 11742 | 200 | 237 | 594 | -10871 | -12447 | 267 | 611 | 418 | 13120 |
| 71 | 2 | 2670 | 8057 | 267 | 100 | 1192 | -6679 | -7647 | 367 | 1170 | 176 | 8971 |
| 71 | 3 | 1335 | 6990 | 33 | 177 | 1150 | -6982 | -7994 | 67 | 1062 | 312 | 7955 |
| 71 | 4 | 234 | 3854 | 0 | 373 | 0 | -3993 | -4572 | 0 | 0 | 657 | 4149 |
| 71 | 5 | 13784 | 4473 | 1936 | 415 | 3071 | 5825 | 5087 | 2770 | 2464 | 729 | 5504 |
| 71 | 5 | 13784 | 4473 | 1936 | 415 | 3071 | 5825 | 5087 | 2770 | 2464 | 729 | 5504 |
| 71 | 6 | 38883 | 10707 | 5741 | 470 | 7112 | 20594 | 17986 | 8010 | 6148 | 826 | 13923 |
| 71 | 7 | 15753 | 9398 | 1936 | 493 | 5040 | 822 | 718 | 2670 | 4842 | 868 | 9325 |
| 71 | 8 | 20092 | 11951 | 2270 | 499 | 7532 | 110 | 96 | 3271 | 6726 | 878 | 12392 |
| 71 | 9 | 32141 | 29574 | 4406 | 442 | 7759 | -5634 | -6451 | 6141 | 7044 | 777 | 30771 |
| 71 | 10 | 24965 | 25801 | 3371 | 355 | 6309 | -7500 | -8587 | 4773 | 5461 | 625 | 27466 |
| 71 | 11 | 3271 | 20053 | 100 | 285 | 2717 | -19784 | -22653 | 234 | 2316 | 502 | 23106 |
| 71 | 12 | 14452 | 23495 | 2303 | 187 | 1707 | -10937 | -12523 | 3137 | 1631 | 329 | 25015 |
| | | 169282 | 166095 | 22563 | 4033 | 44183 | -45029 | -58988 | 31707 | 39475 | 7097 | 181698 |
| 72 | 1 | 5340 | 11016 | 567 | 237 | 2200 | -8113 | -9289 | 768 | 2203 | 418 | 12008 |
| 72 | 2 | 9045 | 9765 | 1235 | 100 | 2211 | -3031 | -3470 | 1736 | 1952 | 176 | 10387 |
| 72 | 3 | 10046 | 9057 | 1936 | 177 | -667 | 1479 | 1292 | 2670 | -865 | 312 | 9307 |
| 72 | 4 | 8911 | 9323 | 567 | 373 | 5771 | -6556 | -7507 | 868 | 5365 | 657 | 10396 |
| 72 | 4 | 8911 | 9323 | 567 | 373 | 5771 | -6556 | -7507 | 868 | 5365 | 657 | 10396 |
| 72 | 5 | 45758 | 23497 | 7042 | 415 | 6784 | 15062 | 13155 | 9746 | 5931 | 729 | 25943 |
| 72 | 6 | 36380 | 22350 | 5273 | 470 | 7195 | 6365 | 5559 | 7343 | 6373 | 826 | 23622 |
| 72 | 7 | 23797 | 20864 | 3171 | 493 | 6249 | -3809 | -4361 | 4472 | 5520 | 868 | 21770 |
| 72 | 8 | 21661 | 28866 | 2804 | 499 | 6145 | -13849 | -15857 | 4005 | 5294 | 878 | 31346 |
| 72 | 9 | 16955 | 25482 | 2003 | 442 | 5872 | -14841 | -16993 | 2837 | 5361 | 777 | 27810 |
| 72 | 10 | 9545 | 17530 | 935 | 355 | 4374 | -12714 | -14558 | 1302 | 4226 | 625 | 19252 |
| 72 | 11 | 9245 | 25068 | 1101 | 285 | 3150 | -19258 | -22050 | 1569 | 2835 | 502 | 27958 |
| 72 | 12 | 13951 | 13633 | 1936 | 187 | 3238 | -3107 | -3558 | 2737 | 2767 | 329 | 14413 |
| | | 210634 | 216451 | 28570 | 4033 | 52522 | -62372 | -77638 | 40053 | 46962 | 7097 | 234213 |
| 73 | 1 | 11381 | 12492 | 1702 | 237 | 1961 | -3309 | -3789 | 2303 | 1970 | 418 | 12782 |
| 73 | 2 | 7376 | 9674 | 868 | 100 | 2574 | -4972 | -5693 | 1235 | 2329 | 176 | 10564 |
| 73 | 3 | 5874 | 8011 | 734 | 177 | 1810 | -4124 | -4722 | 1035 | 1646 | 312 | 8638 |
| 73 | 3 | 5874 | 8011 | 734 | 177 | 1810 | -4124 | -4722 | 1035 | 1646 | 312 | 8638 |
| 73 | 4 | 7476 | 4996 | 1168 | 373 | 1011 | 1096 | 957 | 1569 | 1066 | 657 | 4796 |
| 73 | 5 | 3605 | 3848 | 167 | 415 | 2681 | -3339 | -3823 | 267 | 2513 | 729 | 4186 |
| 73 | 6 | 29805 | 5836 | 4005 | 470 | 7639 | 15860 | 13852 | 5607 | 6890 | 826 | 8237 |
| 73 | 7 | 20493 | 18211 | 2637 | 493 | 5901 | -4112 | -4708 | 3705 | 5353 | 868 | 18980 |
| 73 | 8 | 48795 | 25813 | 6942 | 499 | 10375 | 12108 | 10575 | 9545 | 9787 | 878 | 27555 |
| 73 | 9 | 21995 | 31276 | 2637 | 442 | 7402 | -17125 | -19608 | 3605 | 7264 | 777 | 33562 |
| 73 | 10 | 11214 | 20494 | 1068 | 355 | 5304 | -14939 | -17105 | 1569 | 4804 | 625 | 22890 |
| 73 | 11 | 1535 | 13520 | 67 | 285 | 1166 | -13436 | -15384 | 134 | 990 | 502 | 15427 |
| 73 | 12 | 8210 | 11941 | 1168 | 187 | 1746 | -5664 | -6485 | 1669 | 1391 | 329 | 12975 |
| | | 177759 | 166112 | 23163 | 4033 | 49570 | -41956 | -55934 | 32243 | 46003 | 7097 | 180593 |
| 74 | 1 | 8477 | 11935 | 1168 | 237 | 2013 | -5708 | -6536 | 1602 | 1931 | 418 | 12664 |
| 74 | 2 | 334 | 8291 | 0 | 100 | 0 | -8057 | -9225 | 0 | 0 | 176 | 9383 |
| 74 | 2 | 334 | 8291 | 0 | 100 | 0 | -8057 | -9225 | 0 | 0 | 176 | 9383 |
| 74 | 3 | 7576 | 5639 | 1135 | 177 | 1296 | 464 | 405 | 1535 | 1302 | 312 | 5557 |
| 74 | 4 | 7042 | 5996 | 935 | 373 | 1870 | -1197 | -1371 | 1302 | 1723 | 657 | 6033 |
| 74 | 5 | 8778 | 4965 | 868 | 415 | 3975 | -577 | -661 | 1202 | 3868 | 729 | 4842 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 74 6 | 27101 | 5740 | 3705 | 470 | 6598 | 14293 | 12483 | 5173 | 5960 | 826 | 7832 |
| 74 7 | 20326 | 14464 | 2136 | 493 | 8504 | -3135 | -3590 | 3071 | 7778 | 868 | 15270 |
| 74 8 | 31006 | 22120 | 4372 | 499 | 6809 | 1578 | 1378 | 6074 | 6182 | 878 | 22568 |
| 74 9 | 21294 | 18332 | 2436 | 442 | 7810 | -5290 | -6057 | 3538 | 6836 | 777 | 19738 |
| 74 10 | 12282 | 18766 | 1569 | 355 | 3601 | -10440 | -11954 | 2203 | 3280 | 625 | 20331 |
| 74 11 | 15420 | 14339 | 2370 | 285 | 2305 | -1509 | -1728 | 3237 | 2189 | 502 | 14457 |
| 74 12 | 3905 | 15840 | 534 | 187 | 950 | -13072 | -14967 | 734 | 904 | 329 | 17639 |
| | 163541 | 146427 | 21228 | 4033 | 45731 | -32650 | -41821 | 29671 | 41953 | 7097 | 156312 |
| 75 1 | 4639 | 8150 | 467 | 237 | 2053 | -5801 | -6642 | 634 | 2048 | 418 | 8815 |
| ■5 1 | 4639 | 8150 | 467 | 237 | 2053 | -5801 | -6642 | 634 | 2048 | 418 | 8815 |
| 75 2 | 3004 | 5890 | 267 | 100 | 1526 | -4512 | -5166 | 401 | 1367 | 176 | 6627 |
| 75 3 | 2036 | 4920 | 167 | 177 | 1112 | -4173 | -4778 | 267 | 945 | 312 | 5557 |
| 75 4 | 1769 | 6217 | 134 | 373 | 1030 | -5851 | -6699 | 167 | 1087 | 657 | 6724 |
| 75 5 | 16488 | 7060 | 1802 | 415 | 6513 | 2500 | 2183 | 2670 | 5576 | 729 | 8000 |
| 75 6 | 0 | 0 | 0 | 470 | 0 | -470 | -538 | 0 | 0 | 826 | 0 |
| 75 7 | 0 | 0 | 0 | 493 | 0 | -493 | -564 | 0 | 0 | 868 | 0 |
| 75 8 | 0 | 0 | 0 | 499 | 0 | -499 | -571 | 0 | 0 | 878 | 0 |
| 75 9 | 0 | 0 | 0 | 442 | 0 | -442 | -506 | 0 | 0 | 777 | 0 |
| 75 10 | 0 | 0 | 0 | 355 | 0 | -355 | -406 | 0 | 0 | 625 | 0 |
| 75 11 | 0 | 0 | 0 | 285 | 0 | -285 | -326 | 0 | 0 | 502 | 0 |
| 75 12 | 0 | 0 | 0 | 187 | 0 | -187 | -214 | 0 | 0 | 329 | 0 |
| | 27936 | 32237 | 2837 | 4033 | 12234 | -20568 | -24229 | 4139 | 11023 | 7097 | 35723 |

AJYQJYE. 16.24.05. 77/02/19.



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THIS IS D I S P O S E D OUTPUT.
■THIS IS D I S P O S E D OUTPUT.

IT WILL NOT HAVE A CARD DECK.

PLEASE PUT OUT FOR USER 9364003

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Exhibit 7.8: CLADM Quality Output for Western C-4 Using 1973-74 Land Uses.

WEST TAMIAMI CANAL BASIN
1973-4 LAND USES

| | | TLSS | TLBOD | TLN | TLP | TCSS | TCBOD | TCN | TCP |
|---|---|---|---|---|---|---|---|---|---|
| 63 | 1 | 0 | 32583 | 33188 | 424 | 0.00 | 1.62 | 1.65 | .021 |
| 63 | 2 | 33497 | 48462 | 44550 | 2371 | 1.09 | 1.57 | 1.44 | .077 |
| 63 | 3 | 35811 | 24565 | 31013 | 1981 | 1.47 | 1.01 | 1.27 | .081 |
| [illegible]3 | 3 | 35811 | 24565 | 31013 | 1981 | 1.47 | 1.01 | 1.27 | .081 |
| 63 | 4 | 2803 | 2407 | 10412 | 71 | .31 | .27 | 1.15 | .008 |
| 63 | 5 | 593141 | 55881 | 17701 | 202 | 56.45 | 5.32 | 1.68 | .019 |
| 63 | 6 | 599911 | 28246 | 33645 | 951 | 18.22 | .86 | 1.02 | .029 |
| 63 | 7 | 105080 | 18324 | 22567 | 174 | 9.69 | 1.69 | 2.08 | .016 |
| 63 | 8 | 552662 | 31770 | 29686 | 238 | 36.83 | 2.12 | 1.98 | .016 |
| 63 | 9 | 1441254 | 41818 | 55861 | 529 | 33.24 | .96 | 1.29 | .012 |
| 63 | 10 | 385808 | 20096 | 91076 | 1064 | 7.30 | .38 | 1.72 | .020 |
| 63 | 11 | 82037 | 20225 | 37098 | 200 | 4.54 | 1.12 | 2.05 | .011 |
| 63 | 12 | 472554 | 43205 | 21994 | 151 | 31.82 | 2.91 | 1.48 | .010 |
| | | 4304558 | 367582 | 428792 | 8354 | 15.22 | 1.30 | 1.52 | .030 |
| 64 | 1 | 29326 | 7491 | 32024 | 389 | 1.26 | .32 | 1.38 | .017 |
| 64 | 2 | 245415 | 37571 | 22926 | 1004 | 18.72 | 2.87 | 1.75 | .077 |
| 64 | 3 | 20875 | 13190 | 13896 | 859 | 1.99 | 1.26 | 1.33 | .082 |
| 64 | 4 | 460749 | 43788 | 17527 | 179 | 50.43 | 4.79 | 1.92 | .020 |
| 64 | 5 | 524300 | 23355 | 7964 | 75 | 111.25 | 4.96 | 1.69 | .016 |
| [illegible]4 | 5 | 524300 | 23355 | 7964 | 75 | 111.25 | 4.96 | 1.69 | .016 |
| 64 | 6 | 1499631 | 39838 | 33984 | 725 | 47.44 | 1.26 | 1.08 | .023 |
| 64 | 7 | 480542 | 29658 | 57734 | 404 | 15.39 | .95 | 1.85 | .013 |
| 64 | 8 | 1147281 | 35999 | 40040 | 293 | 43.67 | 1.37 | 1.52 | .011 |
| 64 | 9 | 339410 | 22262 | 28354 | 296 | 16.66 | 1.09 | 1.39 | .015 |
| 64 | 10 | 980538 | 40447 | 38759 | 422 | 35.56 | 1.47 | 1.41 | .015 |
| 64 | 11 | 218308 | 26336 | 50080 | 265 | 8.42 | 1.02 | 1.93 | .010 |
| 64 | 12 | 728577 | 23866 | 36499 | 100 | 22.08 | .72 | 1.11 | .003 |
| | | 6674952 | 343801 | 379787 | 5011 | 26.01 | 1.34 | 1.48 | .020 |
| 65 | 1 | 151562 | 34662 | 35551 | 444 | 6.79 | 1.55 | 1.59 | .020 |
| 65 | 2 | 392935 | 23148 | 53250 | 3054 | 10.01 | .59 | 1.36 | .078 |
| 65 | 3 | 626295 | 35086 | 44203 | 2572 | 17.31 | .97 | 1.22 | .071 |
| 65 | 4 | 180259 | 23061 | 20198 | 167 | 12.39 | 1.58 | 1.39 | .011 |
| 65 | 5 | 0 | 13440 | 13937 | 126 | 0.00 | 1.45 | 1.50 | .014 |
| 65 | 6 | 885827 | 43755 | 17640 | 258 | 77.07 | 3.81 | 1.53 | .022 |
| 65 | 7 | 791159 | 34700 | 40658 | 292 | 35.03 | 1.54 | 1.80 | .013 |
| [illegible]5 | 7 | 791159 | 34700 | 40658 | 292 | 35.03 | 1.54 | 1.80 | .013 |
| 65 | 8 | 519233 | 25736 | 20944 | 169 | 44.96 | 2.23 | 1.81 | .015 |
| 65 | 9 | 1434571 | 40593 | 26809 | 232 | 63.87 | 1.81 | 1.19 | .010 |
| 65 | 10 | 2024410 | 50307 | 60973 | 619 | 43.26 | 1.08 | 1.30 | .013 |
| 65 | 11 | 23794 | 13369 | 80307 | 362 | .59 | .33 | 1.99 | .009 |
| 65 | 12 | 31183 | 19413 | 33947 | 90 | 1.20 | .74 | 1.30 | .003 |
| | | 7061228 | 357270 | 448417 | 8385 | 23.31 | 1.18 | 1.48 | .028 |
| 66 | 1 | 446614 | 41493 | 48820 | 587 | 13.49 | 1.25 | 1.47 | .018 |
| 66 | 2 | 192425 | 33216 | 31451 | 1238 | 8.11 | 1.40 | 1.33 | .052 |
| 66 | 3 | 426877 | 31927 | 31483 | 1756 | 17.08 | 1.28 | 1.26 | .070 |
| 66 | 4 | 232246 | 13127 | 23738 | 168 | 11.60 | .66 | 1.19 | .008 |
| 66 | 5 | 822328 | 43801 | 30218 | 263 | 40.18 | 2.14 | 1.49 | .013 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 66 | 6 | 1541336 | 54409 | 43202 | 774 | 32.05 | 1.13 | .90 | .016 |
| 66 | 7 | 568046 | 29398 | 89580 | 597 | 10.94 | .57 | 1.73 | .012 |
| 66 | 8 | 530676 | 24799 | 77048 | 551 | 12.40 | .58 | 1.80 | .013 |
| 66 | 9 | 771601 | 32471 | 68014 | 685 | 15.18 | .64 | 1.34 | .013 |
| ‖6 | 9 | 771601 | 32471 | 68014 | 685 | 15.18 | .64 | 1.34 | .013 |
| 66 | 10 | 1206026 | 33570 | 75399 | 829 | 24.19 | .67 | 1.51 | .017 |
| 66 | 11 | 306930 | 22776 | 69468 | 334 | 8.22 | .61 | 1.86 | .009 |
| 66 | 12 | 29609 | 16374 | 31029 | 78 | 1.22 | .67 | 1.28 | .003 |
| | | 7074714 | 377361 | 619450 | 7860 | 16.55 | .88 | 1.45 | .018 |
| 67 | 1 | 173059 | 38610 | 34811 | 436 | 7.72 | 1.72 | 1.55 | .019 |
| 67 | 2 | 45872 | 16136 | 28053 | 1631 | 2.33 | .82 | 1.43 | .083 |
| 67 | 3 | 333346 | 37801 | 23594 | 1142 | 19.43 | 2.20 | 1.38 | .067 |
| 67 | 4 | 0 | 2770 | 15247 | 102 | 0.00 | .21 | 1.14 | .008 |
| 67 | 5 | 142502 | 39283 | 15927 | 180 | 18.46 | 5.09 | 2.06 | .023 |
| 67 | 6 | 1502621 | 46382 | 28085 | 489 | 47.09 | 1.45 | .88 | .015 |
| 67 | 7 | 341158 | 21066 | 61138 | 413 | 9.62 | .59 | 1.72 | .012 |
| 67 | 8 | 494863 | 35958 | 40449 | 322 | 20.40 | 1.48 | 1.67 | .013 |
| 67 | 9 | 675598 | 30199 | 16141 | 159 | 40.45 | 1.81 | .97 | .010 |
| 67 | 10 | 880840 | 27760 | 38557 | 417 | 25.98 | .82 | 1.14 | .012 |
| 67 | 11 | 213308 | 22836 | 41272 | 220 | 9.32 | 1.00 | 1.80 | .010 |
| ‖7 | 11 | 213308 | 22836 | 41272 | 220 | 9.32 | 1.00 | 1.80 | .010 |
| 67 | 12 | 81128 | 26754 | 25155 | 104 | 4.49 | 1.48 | 1.39 | .006 |
| | | 4884295 | 345555 | 368429 | 5616 | 18.53 | 1.31 | 1.40 | .021 |
| 68 | 1 | 140720 | 22508 | 53549 | 653 | 3.68 | .59 | 1.40 | .017 |
| 68 | 2 | 291453 | 31012 | 52198 | 2945 | 7.83 | .83 | 1.40 | .079 |
| 68 | 3 | 40571 | 14123 | 35980 | 2475 | 1.31 | .45 | 1.16 | .080 |
| 68 | 4 | 169111 | 38056 | 26521 | 237 | 9.66 | 2.17 | 1.51 | .014 |
| 68 | 5 | 2660789 | 53730 | 76523 | 539 | 39.65 | .80 | 1.14 | .008 |
| 68 | 6 | 1977445 | 44210 | 112033 | 3375 | 15.56 | .35 | .88 | .027 |
| 68 | 7 | 324655 | 21150 | 195853 | 1259 | 3.05 | .20 | 1.84 | .012 |
| 68 | 8 | 674063 | 32231 | 143620 | 1014 | 8.91 | .43 | 1.90 | .013 |
| 68 | 9 | 1127796 | 39916 | 114520 | 1147 | 12.74 | .45 | 1.29 | .013 |
| 68 | 10 | 779341 | 27297 | 201481 | 2345 | 6.58 | .23 | 1.70 | .020 |
| 68 | 11 | 64033 | 10643 | 132670 | 571 | .94 | .16 | 1.94 | .008 |
| 68 | 12 | 0 | 2855 | 54946 | 56 | 0.00 | .06 | 1.17 | .001 |
| | | 8249977 | 337731 | 1199893 | 16615 | 10.04 | .41 | 1.46 | .020 |
| ‖ | | 8249977 | 337731 | 1199893 | 16615 | 10.04 | .41 | 1.46 | .020 |
| 69 | 1 | 918532 | 69415 | 83996 | 998 | 15.97 | 1.21 | 1.46 | .017 |
| 69 | 2 | 356993 | 19514 | 54590 | 3192 | 8.85 | .48 | 1.35 | .079 |
| 69 | 3 | 203959 | 31735 | 40841 | 2549 | 6.27 | .97 | 1.25 | .078 |
| 69 | 4 | 620970 | 32697 | 40385 | 297 | 18.83 | .99 | 1.22 | .009 |
| 69 | 5 | 1113178 | 36019 | 77042 | 583 | 17.91 | .58 | 1.24 | .009 |
| 69 | 6 | 1268882 | 36922 | 116367 | 3703 | 10.55 | .31 | .97 | .031 |
| 69 | 7 | 756941 | 31840 | 135418 | 885 | 10.06 | .42 | 1.80 | .012 |
| 69 | 8 | 270005 | 21558 | 169383 | 1184 | 3.22 | .26 | 2.02 | .014 |
| 69 | 9 | 788865 | 36098 | 94012 | 953 | 11.23 | .51 | 1.34 | .014 |
| 69 | 10 | 1624956 | 42899 | 137519 | 1543 | 18.84 | .50 | 1.59 | .018 |
| 69 | 11 | 3681 | 15540 | 180766 | 783 | .04 | .17 | 1.97 | .009 |
| 69 | 12 | 121063 | 16805 | 69663 | 111 | 2.09 | .29 | 1.20 | .002 |
| | | 8048025 | 391042 | 1199983 | 16781 | 9.92 | .48 | 1.48 | .021 |
| 70 | 1 | 315679 | 40773 | 73821 | 897 | 6.23 | .80 | 1.46 | .018 |
| 70 | 2 | 240913 | 17508 | 54206 | 3231 | 6.03 | .44 | 1.36 | .081 |

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|---|---|---|---|---|---|---|---|---|---|
| 70 | 2 | 240913 | 17508 | 54206 | 3231 | 6.03 | .44 | 1.36 | .081 |
| 70 | 3 | 351780 | 31734 | 46106 | 2874 | 9.35 | .84 | 1.23 | .076 |
| 70 | 4 | 144769 | 10949 | 46029 | 309 | 3.60 | .27 | 1.14 | .008 |
| 70 | 5 | 1665693 | 63623 | 62777 | 501 | 34.22 | 1.31 | 1.29 | .010 |
| 70 | 6 | 576984 | 24775 | 78034 | 2540 | 7.31 | .31 | 99 | .032 |
| 70 | 7 | 410115 | 31902 | 119467 | 797 | 6.57 | .51 | 1.91 | .013 |
| 70 | 8 | 384092 | 27031 | 127317 | 903 | 6.19 | .44 | 2.05 | .015 |
| 70 | 9 | 1108371 | 34022 | 118127 | 1177 | 12.69 | .39 | 1.35 | .013 |
| 70 | 10 | 174451 | 24083 | 126453 | 1499 | 2.49 | .34 | 1.81 | .021 |
| 70 | 11 | 0 | 0 | 90639 | 374 | 0.00 | 0.00 | 1.94 | .008 |
| 70 | 12 | 0 | 2415 | 43154 | 45 | 0.00 | .07 | 1.17 | .001 |
| | | 5372847 | 308815 | 986130 | 15148 | 8.12 | .47 | 1.49 | .023 |
| 71 | 1 | 37375 | 49857 | 52374 | 666 | 1.17 | 1.56 | 1.64 | .021 |
| 71 | 2 | 45063 | 28745 | 33803 | 1873 | 2.06 | 1.31 | 1.54 | .086 |
| 71 | 3 | 0 | 17677 | 24120 | 1571 | 0.00 | .93 | 1.27 | .083 |
| 71 | 4 | 0 | 0 | 11522 | 73 | 0.00 | 0.00 | 1.10 | .007 |
| 71 | 5 | 602927 | 69625 | 26522 | 291 | 49.60 | 5.73 | 2.18 | .024 |
| 71 | 5 | 602927 | 69625 | 26522 | 291 | 49.60 | 5.73 | 2.18 | .024 |
| 71 | 6 | 1714822 | 50273 | 33539 | 621 | 58.93 | 1.73 | 1.15 | .021 |
| 71 | 7 | 472036 | 29475 | 47673 | 339 | 18.48 | 1.15 | 1.87 | .013 |
| 71 | 8 | 568889 | 30107 | 63576 | 468 | 17.51 | .93 | 1.96 | .014 |
| 71 | 9 | 1201511 | 34778 | 108036 | 1072 | 14.95 | .43 | 1.34 | .013 |
| 71 | 10 | 920902 | 35363 | 121313 | 1395 | 13.13 | .50 | 1.73 | .020 |
| 71 | 11 | 16656 | 3559 | 106043 | 446 | .31 | .07 | 1.95 | .008 |
| 71 | 12 | 562934 | 45023 | 79535 | 205 | 8.82 | .71 | 1.25 | .003 |
| | | 6143115 | 394482 | 708057 | 9020 | 13.61 | .87 | 1.57 | .020 |
| 72 | 1 | 123709 | 17880 | 42238 | 513 | 4.13 | .60 | 1.41 | .017 |
| 72 | 2 | 317829 | 28972 | 38064 | 2042 | 11.98 | 1.09 | 1.43 | .077 |
| 72 | 3 | 596451 | 41438 | 33074 | 1683 | 24.23 | 1.68 | 1.34 | .068 |
| 72 | 4 | 135121 | 23030 | 31789 | 243 | 5.33 | .91 | 1.25 | .010 |
| 72 | 5 | 1911366 | 46543 | 75515 | 552 | 29.93 | .73 | 1.18 | .009 |
| 72 | 6 | 1103508 | 31469 | 57616 | 1679 | 18.17 | .52 | .95 | .028 |
| 72 | 7 | 754961 | 35491 | 103701 | 693 | 13.31 | .63 | 1.83 | .012 |
| 72 | 7 | 754961 | 35491 | 103701 | 693 | 13.31 | .63 | 1.83 | .012 |
| 72 | 8 | 734738 | 31685 | 156144 | 1095 | 9.37 | .40 | 1.99 | .014 |
| 72 | 9 | 522619 | 25955 | 95921 | 977 | 7.55 | .37 | 1.39 | .014 |
| 72 | 10 | 256254 | 26759 | 87385 | 1036 | 5.38 | .56 | 1.83 | .022 |
| 72 | 11 | 309884 | 19383 | 132240 | 584 | 4.55 | .28 | 1.94 | .009 |
| 72 | 12 | 608099 | 33538 | 47463 | 141 | 16.41 | .91 | 1.28 | .004 |
| | | 7374539 | 362143 | 901149 | 11239 | 12.54 | .62 | 1.53 | .019 |
| 73 | 1 | 456661 | 28337 | 47611 | 562 | 13.45 | .83 | 1.40 | .017 |
| 73 | 2 | 237125 | 25476 | 37836 | 2093 | 9.02 | .97 | 1.44 | .080 |
| 73 | 3 | 209329 | 28366 | 28523 | 1676 | 9.61 | 1.30 | 1.31 | .077 |
| 73 | 4 | 347463 | 29181 | 19590 | 169 | 25.59 | 2.15 | 1.44 | .012 |
| 73 | 5 | 12957 | 13794 | 15167 | 135 | 1.24 | 1.32 | 1.45 | .013 |
| 73 | 6 | 1218319 | 48282 | 22030 | 325 | 76.81 | 3.04 | 1.39 | .021 |
| 73 | 7 | 761928 | 26071 | 90769 | 592 | 15.39 | .53 | 1.83 | .012 |
| 73 | 8 | 2007616 | 53479 | 128111 | 893 | 28.62 | .76 | 1.83 | .013 |
| 73 | 9 | 594972 | 25403 | 115440 | 1171 | 7.00 | .30 | 1.36 | .014 |
| 73 | 9 | 594972 | 25403 | 115440 | 1171 | 7.00 | .30 | 1.36 | .014 |
| 73 | 10 | 212903 | 25490 | 100559 | 1193 | 3.82 | .46 | 1.81 | .021 |
| 73 | 11 | 5756 | 4298 | 71864 | 306 | .16 | .12 | 1.96 | .008 |
| 73 | 12 | 343791 | 42294 | 44831 | 168 | 10.59 | 1.30 | 1.38 | .005 |
| | | 6408820 | 350471 | 722332 | 9284 | 14.20 | .78 | 1.60 | .021 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 74 | 1 | 320370 | 27832 | 46623 | 559 | 9.88 | .86 | 1.44 | .017 |
| 74 | 2 | 0 | 0 | 29293 | 1893 | 0.00 | 0.00 | 1.30 | .084 |
| 74 | 3 | 353600 | 46249 | 24974 | 1131 | 23.07 | 3.02 | 1.63 | .074 |
| 74 | 4 | 299501 | 29038 | 22965 | 191 | 18.38 | 1.78 | 1.41 | .012 |
| 74 | 5 | 226980 | 33840 | 21998 | 211 | 16.82 | 2.51 | 1.63 | .016 |
| 74 | 6 | 1091584 | 34067 | 18843 | 298 | 69.97 | 2.18 | 1.21 | .019 |
| 74 | 7 | 552722 | 33530 | 74255 | 510 | 14.06 | .85 | 1.89 | .013 |
| 74 | 8 | 1277034 | 37399 | 114200 | 796 | 21.24 | .62 | 1.90 | .013 |
| 74 | 9 | 610799 | 29779 | 69005 | 702 | 12.26 | .60 | 1.39 | .014 |
| 74 | 10 | 377294 | 21937 | 89998 | 1053 | 7.40 | .43 | 1.76 | .021 |
| 74 | 11 | 577458 | 36327 | 74096 | 380 | 14.82 | .93 | 1.90 | .010 |
| 74 | 11 | 577458 | 36327 | 74096 | 380 | 14.82 | .93 | 1.90 | .010 |
| 74 | 12 | 157413 | 17817 | 52907 | 100 | 3.66 | .41 | 1.23 | .002 |
| | | 5844755 | 347815 | 639158 | 7825 | 14.69 | .87 | 1.61 | .020 |
| 75 | 1 | 97632 | 25432 | 33666 | 419 | 4.41 | 1.15 | 1.52 | .019 |
| 75 | 2 | 62990 | 24558 | 25376 | 1365 | 3.93 | 1.53 | 1.59 | .085 |
| 75 | 3 | 43050 | 13874 | 17107 | 1079 | 3.22 | 1.04 | 1.28 | .081 |
| 75 | 4 | 18154 | 20687 | 22621 | 184 | 1.07 | 1.22 | 1.34 | .011 |
| 75 | 5 | 507325 | 46790 | 30204 | 282 | 26.44 | 2.44 | 1.57 | .015 |
| 75 | 6 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 7 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 8 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 9 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 10 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 11 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 12 | 0 | 0 | 0 | 0 | I | I | I | I |
| | | 729151 | 131341 | 128974 | 3329 | 8.32 | 1.50 | 1.47 | .038 |

127

AJYQIDX. 02.01.21. 77/02/19.

EXHIBIT 7.9: CLADM Quality Output for Western C-4
Using Planned Scenario.

## WEST TAMIAMI CANAL BASIN
## PATTERN SCENARIO LAND USES

| | | TLSS | TLBOD | TLN | TLP | TCSS | TCBOD | TCN | TCP |
|---|---|---|---|---|---|---|---|---|---|
| 63 | 1 | 0 | 72731 | 39609 | 554 | 0.00 | 3.20 | 1.74 | .024 |
| 63 | 2 | 31171 | 44976 | 54248 | 2601 | .95 | 1.37 | 1.66 | .079 |
| 63 | 3 | 23839 | 60347 | 37251 | 2300 | .86 | 2.18 | 1.35 | .083 |
| 63 | 3 | 23839 | 60347 | 37251 | 2300 | .86 | 2.18 | 1.35 | .083 |
| 63 | 4 | 2322 | 7154 | 11730 | 88 | .23 | .72 | 1.18 | .009 |
| 63 | 5 | 489430 | 143198 | 26727 | 423 | 32.95 | 9.64 | 1.80 | .028 |
| 63 | 6 | 483544 | 59981 | 34336 | 983 | 13.88 | 1.72 | .99 | .028 |
| 63 | 7 | 68153 | 43582 | 23851 | 229 | 6.13 | 3.92 | 2.14 | .021 |
| 63 | 8 | 415563 | 74681 | 31350 | 335 | 25.29 | 4.54 | 1.91 | .020 |
| 63 | 9 | 1149460 | 73365 | 55403 | 601 | 23.71 | 1.51 | 1.14 | .012 |
| 63 | 10 | 299983 | 43645 | 95637 | 1156 | 5.28 | .77 | 1.68 | .020 |
| 63 | 11 | 55012 | 49943 | 41058 | 275 | 2.84 | 2.58 | 2.12 | .014 |
| 63 | 12 | 384190 | 107721 | 27888 | 305 | 21.80 | 6.11 | 1.58 | .017 |
| | | 3402667 | 781324 | 479087 | 9850 | 10.89 | 2.50 | 1.53 | .032 |
| 64 | 1 | 17519 | 16581 | 36001 | 450 | .68 | .64 | 1.39 | .017 |
| 64 | 2 | 205190 | 96597 | 27524 | 1101 | 14.99 | 7.05 | 2.01 | .080 |
| 64 | 3 | 8038 | 30065 | 16446 | 990 | .68 | 2.54 | 1.39 | .084 |
| 64 | 4 | 440694 | 114278 | 23538 | 347 | 43.94 | 11.40 | 2.35 | .035 |
| 64 | 5 | 582172 | 56801 | 11529 | 161 | 75.80 | 7.40 | 1.50 | .021 |
| 64 | 5 | 582172 | 56801 | 11529 | 161 | 75.80 | 7.40 | 1.50 | .021 |
| 64 | 6 | 1512720 | 67058 | 35549 | 789 | 41.60 | 1.84 | .98 | .022 |
| 64 | 7 | 428115 | 69531 | 57936 | 480 | 13.35 | 2.17 | 1.81 | .015 |
| 64 | 8 | 1080295 | 67732 | 43321 | 382 | 33.87 | 2.12 | 1.36 | .012 |
| 64 | 9 | 311432 | 50350 | 29415 | 348 | 14.48 | 2.34 | 1.37 | .016 |
| 64 | 10 | 949428 | 84681 | 44590 | 559 | 27.88 | 2.49 | 1.31 | .016 |
| 64 | 11 | 195893 | 65600 | 53304 | 357 | 7.16 | 2.40 | 1.95 | .013 |
| 64 | 12 | 717459 | 45415 | 37114 | 155 | 20.09 | 1.27 | 1.04 | .004 |
| | | 6448955 | 764689 | 416267 | 6119 | 22.38 | 2.65 | 1.44 | .021 |
| 65 | 1 | 101546 | 88187 | 42485 | 598 | 4.06 | 3.53 | 1.70 | .024 |
| 65 | 2 | 297481 | 53626 | 57228 | 3247 | 7.06 | 1.27 | 1.36 | .077 |
| 65 | 3 | 470960 | 77810 | 46255 | 2629 | 12.47 | 2.06 | 1.22 | .070 |
| 65 | 4 | 169830 | 56623 | 22827 | 244 | 11.48 | 3.83 | 1.54 | .016 |
| 65 | 5 | 0 | 30311 | 16607 | 174 | 0.00 | 2.84 | 1.56 | .016 |
| 65 | 6 | 861043 | 101916 | 24464 | 463 | 51.89 | 6.14 | 1.47 | .028 |
| 65 | 7 | 762018 | 74786 | 43618 | 392 | 29.86 | 2.93 | 1.71 | .015 |
| 65 | 7 | 762018 | 74786 | 43618 | 392 | 29.86 | 2.93 | 1.71 | .015 |
| 65 | 8 | 479492 | 52670 | 24516 | 246 | 32.34 | 3.55 | 1.65 | .017 |
| 65 | 9 | 1358059 | 74660 | 34001 | 374 | 41.94 | 2.31 | 1.05 | .012 |
| 65 | 10 | 1897059 | 81569 | 67809 | 770 | 31.92 | 1.37 | 1.14 | .013 |
| 65 | 11 | 11722 | 30615 | 91878 | 444 | .25 | .66 | 1.99 | .010 |
| 65 | 12 | 16904 | 47833 | 40179 | 159 | .57 | 1.61 | 1.36 | .005 |
| | | 6426114 | 770606 | 511867 | 9739 | 18.11 | 2.17 | 1.44 | .027 |
| 66 | 1 | 332928 | 108594 | 53180 | 732 | 9.82 | 3.20 | 1.57 | .022 |
| 66 | 2 | 106584 | 59134 | 33843 | 1378 | 3.76 | 2.08 | 1.19 | .049 |
| 66 | 3 | 381621 | 75236 | 33819 | 1768 | 14.92 | 2.94 | 1.32 | .069 |
| 66 | 4 | 212591 | 28184 | 25368 | 208 | 9.90 | 1.31 | 1.18 | .010 |
| 66 | 5 | 684315 | 97598 | 33345 | 386 | 30.21 | 4.31 | 1.47 | .017 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 66 | 6 | 2188621 | 77430 | 45875 | 988 | 34.36 | 1.22 | .72 | .016 |
| 66 | 7 | 489420 | 63901 | 87008 | 651 | 9.17 | 1.20 | 1.63 | .012 |
| 66 | 8 | 472789 | 52296 | 75323 | 590 | 10.55 | 1.17 | 1.68 | .013 |
| 66 | 9 | 724965 | 68078 | 66487 | 728 | 14.09 | 1.32 | 1.29 | .014 |
| 66 | 9 | 724965 | 68078 | 66487 | 728 | 14.09 | 1.32 | 1.29 | .014 |
| 66 | 10 | 1152064 | 59060 | 76431 | 893 | 20.71 | 1.06 | 1.37 | .016 |
| 66 | 11 | 286310 | 53725 | 71157 | 404 | 7.41 | 1.39 | 1.84 | .010 |
| 66 | 12 | 22898 | 38402 | 35877 | 130 | .84 | 1.41 | 1.32 | .005 |
| | | 7055106 | 781638 | 637712 | 8856 | 15.11 | 1.67 | 1.37 | .019 |
| 67 | 1 | 157998 | 104900 | 40884 | 592 | 6.72 | 4.46 | 1.74 | .025 |
| 67 | 2 | 37849 | 38885 | 32639 | 1855 | 1.71 | 1.75 | 1.47 | .084 |
| 67 | 3 | 306536 | 98874 | 29201 | 1283 | 16.12 | 5.20 | 1.54 | .067 |
| 67 | 4 | 0 | 5721 | 16679 | 117 | 0.00 | .39 | 1.15 | .008 |
| 67 | 5 | 126751 | 102971 | 20562 | 321 | 16.85 | 13.69 | 2.73 | .043 |
| 67 | 6 | 1464057 | 87001 | 34124 | 704 | 33.78 | 2.01 | .79 | .016 |
| 67 | 7 | 329944 | 46616 | 58193 | 443 | 9.31 | 1.32 | 1.64 | .012 |
| 67 | 8 | 475322 | 85703 | 46596 | 455 | 16.33 | 2.94 | 1.60 | .016 |
| 67 | 9 | 672072 | 65490 | 22418 | 279 | 28.13 | 2.74 | .94 | .012 |
| 67 | 10 | 890313 | 52142 | 44188 | 523 | 20.80 | 1.22 | 1.03 | .012 |
| 67 | 11 | 205781 | 53582 | 41530 | 283 | 8.73 | 2.27 | 1.76 | .012 |
| 67 | 11 | 205781 | 53582 | 41530 | 283 | 8.73 | 2.27 | 1.76 | .012 |
| 67 | 12 | 65680 | 68457 | 29576 | 203 | 3.40 | 3.54 | 1.53 | .011 |
| | | 4732303 | 810342 | 416589 | 7059 | 15.55 | 2.66 | 1.37 | .023 |
| 68 | 1 | 93138 | 60721 | 61253 | 795 | 2.20 | 1.43 | 1.45 | .019 |
| 68 | 2 | 207153 | 76266 | 58583 | 3233 | 5.08 | 1.87 | 1.44 | .079 |
| 68 | 3 | 22225 | 34476 | 41343 | 2796 | .64 | .99 | 1.19 | .080 |
| 68 | 4 | 145361 | 100135 | 32973 | 389 | 7.68 | 5.29 | 1.74 | .021 |
| 68 | 5 | 2673566 | 77909 | 77439 | 609 | 34.97 | 1.02 | 1.01 | .008 |
| 68 | 6 | 2000580 | 67488 | 108411 | 3268 | 14.96 | .50 | .81 | .024 |
| 68 | 7 | 297112 | 45005 | 211097 | 1401 | 2.56 | .39 | 1.82 | .012 |
| 68 | 8 | 486364 | 69528 | 145252 | 1100 | 6.08 | .87 | 1.82 | .014 |
| 68 | 9 | 929504 | 79926 | 110211 | 1182 | 10.31 | .89 | 1.22 | .013 |
| 68 | 10 | 678689 | 52005 | 210650 | 2499 | 5.35 | .41 | 1.66 | .020 |
| 68 | 11 | 52459 | 26105 | 149273 | 670 | .69 | .34 | 1.95 | .009 |
| 68 | 12 | 0 | 5936 | 63009 | 70 | 0.00 | .11 | 1.17 | .001 |
| | | 7586151 | 695500 | 1269494 | 18010 | 8.52 | .78 | 1.43 | .020 |
| | | 7586151 | 695500 | 1269494 | 18010 | 8.52 | .78 | 1.43 | .020 |
| 69 | 1 | 785817 | 167558 | 89225 | 1200 | 13.34 | 2.84 | 1.51 | .020 |
| 69 | 2 | 311656 | 43259 | 59074 | 3425 | 7.16 | .99 | 1.36 | .079 |
| 69 | 3 | 164622 | 78641 | 47788 | 2878 | 4.55 | 2.17 | 1.32 | .080 |
| 69 | 4 | 535904 | 74077 | 41706 | 385 | 15.89 | 2.20 | 1.24 | .011 |
| 69 | 5 | 1009809 | 67417 | 74662 | 630 | 16.10 | 1.07 | 1.19 | .010 |
| 69 | 6 | 1180005 | 64753 | 117649 | 3775 | 9.39 | .52 | .94 | .030 |
| 69 | 7 | 689014 | 67253 | 137625 | 969 | 8.71 | .85 | 1.74 | .012 |
| 69 | 8 | 237026 | 47126 | 187856 | 1360 | 2.52 | .50 | 2.00 | .014 |
| 69 | 9 | 731012 | 80875 | 94237 | 1029 | 10.21 | 1.13 | 1.32 | .014 |
| 69 | 10 | 1573275 | 72741 | 132194 | 1541 | 17.55 | .81 | 1.47 | .017 |
| 69 | 11 | 0 | 36172 | 207583 | 933 | 0.00 | .34 | 1.97 | .009 |
| 69 | 12 | 110308 | 47025 | 79897 | 191 | 1.70 | .73 | 1.23 | .003 |
| | | 7328448 | 846897 | 1269495 | 18317 | 8.47 | .98 | 1.47 | .021 |
| 70 | 1 | 278718 | 101027 | 85319 | 1114 | 4.90 | 1.78 | 1.50 | .020 |
| 70 | 2 | 230961 | 41828 | 60568 | 3564 | 5.25 | .95 | 1.38 | .081 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ■0 | 2 | 230961 | 41828 | 60568 | 3564 | 5.25 | .95 | 1.38 | .081 |
| 70 | 3 | 330787 | 75621 | 53025 | 3212 | 7.88 | 1.80 | 1.26 | .077 |
| 70 | 4 | 133804 | 28267 | 51754 | 377 | 3.01 | .64 | 1.16 | .008 |
| 70 | 5 | 1675694 | 129870 | 67706 | 663 | 30.86 | 2.39 | 1.25 | .012 |
| 70 | 6 | 502471 | 51721 | 84056 | 2759 | 5.83 | .60 | .97 | .032 |
| 70 | 7 | 324865 | 74427 | 129199 | 940 | 4.80 | 1.10 | 1.91 | .014 |
| 70 | 8 | 325735 | 63217 | 140807 | 1063 | 4.72 | .92 | 2.04 | .015 |
| 70 | 9 | 1017424 | 62286 | 120227 | 1257 | 11.04 | .68 | 1.30 | .014 |
| 70 | 10 | 135531 | 57147 | 143136 | 1742 | 1.71 | .72 | 1.81 | .022 |
| 70 | 11 | 0 | 0 | 102629 | 423 | 0.00 | 0.00 | 1.94 | .008 |
| 70 | 12 | 0 | 5086 | 49169 | 55 | 0.00 | .12 | 1.18 | .001 |
| | | 4955990 | 690497 | 1087595 | 17170 | 6.78 | .95 | 1.49 | .024 |
| 71 | 1 | 26501 | 119616 | 63019 | 882 | .74 | 3.35 | 1.77 | .025 |
| 71 | 2 | 34241 | 85018 | 42268 | 2195 | 1.40 | 3.49 | 1.73 | .090 |
| 71 | 3 | 0 | 42630 | 28994 | 1830 | 0.00 | 1.97 | 1.34 | .085 |
| 71 | 4 | 0 | 0 | 12404 | 79 | 0.00 | 0.00 | 1.10 | .007 |
| ■1 | 4 | 0 | 0 | 12404 | 79 | 0.00 | 0.00 | 1.10 | .007 |
| 71 | 5 | 575471 | 91490 | 39005 | 591 | 38.47 | 6.12 | 2.61 | .040 |
| 71 | 6 | 1563008 | 90892 | 37941 | 811 | 41.31 | 2.40 | 1.00 | .021 |
| 71 | 7 | 423062 | 65771 | 46280 | 400 | 16.69 | 2.60 | 1.83 | .016 |
| 71 | 8 | 479836 | 66864 | 63068 | 533 | 14.25 | 1.99 | 1.87 | .016 |
| 71 | 9 | 1105194 | 60017 | 107043 | 1114 | 13.22 | .72 | 1.28 | .013 |
| 71 | 10 | 812247 | 73886 | 125129 | 1504 | 10.88 | .99 | 1.68 | .020 |
| 71 | 11 | 6197 | 7517 | 121662 | 518 | .10 | .12 | 1.94 | .008 |
| 71 | 12 | 498877 | 108962 | 87114 | 360 | 7.34 | 1.60 | 1.28 | .005 |
| | | 5524634 | 812663 | 773928 | 10818 | 11.19 | 1.65 | 1.57 | .022 |
| 72 | 1 | 97418 | 39891 | 46721 | 597 | 2.99 | 1.22 | 1.43 | .018 |
| 72 | 2 | 248422 | 73399 | 42222 | 2177 | 8.80 | 2.60 | 1.50 | .077 |
| 72 | 3 | 548875 | 98715 | 36539 | 1717 | 21.70 | 3.90 | 1.44 | .068 |
| 72 | 4 | 110542 | 55981 | 36867 | 335 | 3.91 | 1.98 | 1.30 | .012 |
| 72 | 5 | 1820854 | 77068 | 75982 | 629 | 25.83 | 1.09 | 1.08 | .009 |
| 72 | 6 | 1070478 | 55166 | 56919 | 1668 | 16.67 | .86 | .89 | .026 |
| ■2 | 6 | 1070478 | 55166 | 56919 | 1668 | 16.67 | .86 | .89 | .026 |
| 72 | 7 | 595490 | 75958 | 104033 | 776 | 10.06 | 1.28 | 1.76 | .013 |
| 72 | 8 | 520848 | 65329 | 164630 | 1225 | 6.11 | .77 | 1.93 | .014 |
| 72 | 9 | 368969 | 55507 | 102962 | 1105 | 4.88 | .73 | 1.36 | .015 |
| 72 | 10 | 179173 | 63658 | 96711 | 1200 | 3.42 | 1.22 | 1.85 | .023 |
| 72 | 11 | 224311 | 45309 | 146787 | 699 | 2.95 | .60 | 1.93 | .009 |
| 72 | 12 | 509366 | 75147 | 50385 | 241 | 13.00 | 1.92 | 1.29 | .006 |
| | | 6294746 | 781128 | 960758 | 12369 | 9.89 | 1.23 | 1.51 | .019 |
| 73 | 1 | 386178 | 62393 | 48911 | 630 | 11.12 | 1.80 | 1.41 | .018 |
| 73 | 2 | 181430 | 63258 | 42795 | 2304 | 6.32 | 2.20 | 1.49 | .080 |
| 73 | 3 | 176939 | 72662 | 33412 | 1852 | 7.54 | 3.10 | 1.42 | .079 |
| 73 | 4 | 328996 | 71291 | 21533 | 259 | 25.24 | 5.47 | 1.65 | .020 |
| 73 | 5 | 0 | 31235 | 17274 | 180 | 0.00 | 2.75 | 1.52 | .016 |
| 73 | 6 | 1105401 | 103483 | 28154 | 537 | 49.38 | 4.62 | 1.26 | .024 |
| 73 | 7 | 694226 | 49893 | 90595 | 642 | 13.46 | .97 | 1.76 | .012 |
| 73 | 8 | 1888361 | 91793 | 125069 | 957 | 25.22 | 1.23 | 1.67 | .013 |
| ■3 | 8 | 1888361 | 91793 | 125069 | 957 | 25.22 | 1.23 | 1.67 | .013 |
| 73 | 9 | 548451 | 52532 | 122269 | 1288 | 6.01 | .58 | 1.34 | .014 |
| 73 | 10 | 169338 | 61227 | 112623 | 1385 | 2.72 | .98 | 1.81 | .022 |
| 73 | 11 | 0 | 10288 | 82042 | 361 | 0.00 | .25 | 1.96 | .009 |
| 73 | 12 | 272899 | 109443 | 52395 | 329 | 7.74 | 3.10 | 1.49 | .009 |
| | | 5752219 | 779498 | 777072 | 10724 | 11.72 | 1.59 | 1.58 | .022 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 74 | 1 | 271875 | 64750 | 50607 | 660 | 7.90 | 1.88 | 1.47 | .019 |
| 74 | 2 | 0 | 0 | 33151 | 2142 | 0.00 | 0.00 | 1.30 | .084 |
| 74 | 3 | 256711 | 118097 | 29640 | 1196 | 17.00 | 7.82 | 1.96 | .079 |
| 74 | 4 | 290138 | 71215 | 25769 | 286 | 17.70 | 4.34 | 1.57 | .017 |
| 74 | 5 | 187487 | 85158 | 24943 | 320 | 14.25 | 6.47 | 1.90 | .024 |
| 74 | 6 | 1055856 | 62729 | 22327 | 430 | 49.60 | 2.95 | 1.05 | .020 |
| 74 | 7 | 482454 | 77705 | 77076 | 614 | 11.63 | 1.87 | 1.86 | .015 |
| 74 | 8 | 1169708 | 65522 | 108402 | 821 | 19.07 | 1.07 | 1.77 | .013 |
| 74 | 9 | 540779 | 64978 | 72702 | 801 | 10.08 | 1.21 | 1.36 | .015 |
| 74 | 10 | 338225 | 46307 | 96218 | 1164 | 6.12 | .84 | 1.74 | .021 |
| 74 | 10 | 338225 | 46307 | 96218 | 1164 | 6.12 | .84 | 1.74 | .021 |
| 74 | 11 | 539895 | 86934 | 74544 | 486 | 13.74 | 2.21 | 1.90 | .012 |
| 74 | 12 | 145132 | 42818 | 60097 | 163 | 3.03 | .89 | 1.25 | .003 |
| | | 5278260 | 786213 | 675476 | 9083 | 12.42 | 1.85 | 1.59 | .021 |
| 75 | 1 | 82282 | 63609 | 38817 | 527 | 3.43 | 2.66 | 1.62 | .022 |
| 75 | 2 | 49389 | 62711 | 30908 | 1590 | 2.74 | 3.48 | 1.72 | .088 |
| 75 | 3 | 30548 | 35923 | 20646 | 1248 | 2.02 | 2.38 | 1.37 | .083 |
| 75 | 4 | 5332 | 49536 | 26425 | 259 | .29 | 2.71 | 1.45 | .014 |
| 75 | 5 | 446558 | 126101 | 37825 | 477 | 20.54 | 5.80 | 1.74 | .022 |
| 75 | 6 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 7 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 8 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 9 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 10 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 11 | 0 | 0 | 0 | 0 | I | I | I | I |
| 75 | 12 | 0 | 0 | 0 | 0 | I | I | I | I |
| | | 614109 | 337880 | 154621 | 4101 | 6.33 | 3.48 | 1.59 | .042 |

132

AJYQJYE. 16.24.06. 77/02/19.

EXHIBIT 7.10: Input Set for C-14 Basin

134

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WMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWM
MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW
WMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWM
MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW

                                      HILLSBORO + C-14
A1
A2      JAY G FOY  CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3                        73-4 LAND USES WEST HILL + BP C-14
#3                        73-4 LAND USES WEST HILL + BP C-14
B1     1       0       1       0       1       0
B2    10       1      12  621201      12
C1 BOCA RATON RAINFALL                11       0  630101  741231       1
E1 HIL+C14             5     4.6 .000001
E228722.      2        .9      1.       0
E3    .1    .104    .048    .078    .169    .182    .213    .216    .219    .200
E3  .156    .129    .082
F1SINGLE   19.94    39.2    100.   99999
F2    5. .000001 .000001    .446   .0562   .0117
F1MULTPL    1.90    70.8    100.   99999
F2    5. .000001 .000001   1.055   .2341   .0383
F1COMMCL    1.01    87.1    100.   99999
F2    5. .000001 .000001   4.478   .3122   .1066
F1INDSTL    9.12    10.8    100.   99999
F2    5. .000001 .000001   1.758   .4948   .0689
F1OPEN     68.03     5.0    100.   99999
F2    5. .000001 .000001    .122   .0758  .00244
H151437.     .23     1.0       0                            .46
H2   .27    .104    .048    .078    .169    .182    .213    .216    .219    .200
H2  .156    .129    .082
J1 4.136   .4136   .0135  .01401 .000583
T1     0
T2   0.0                                2
T3.00001
#3.00001

                                      HILLSBORO + C-14
A1
A2      JAY G FOY  CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3                   PLAN SCENARIO LAND USES WEST HILL + BP C-14
B1     1       0       1       0       1       0
B2    10       1      12  621201      12
C1 BOCA RATON RAINFALL                11       0  630101  741231       1
E1 HIL+C14             5     4.6 .000001
E274918.      2     .525      1.       0
E3    .1    .104    .048    .078    .169    .182    .213    .216    .219    .200
E3  .156    .129    .082
F1SINGLE   86.15    22.7    100.   99999
F2    5. .000001 .000001    .446   .0562   .0117
F1MULTPL    3.40    65.0    100.   99999
F2    5. .000001 .000001   1.055   .2341   .0383
F1COMMCL    2.02    84.6    100.   99999
F2    5. .000001 .000001   4.478   .3122   .1066
F1INDSTL    4.09    65.6    100.   99999
F2    5. .000001 .000001   1.758   .4948   .0689
F1OPEN      4.34    19.6    100.   99999
F2    5. .000001 .000001    .122   .0758  .00244
H1 5241.     .23      1.       0                            .46
H2    .3    .104    .048    .078    .169    .182    .213    .216    .219    .200
#2    .3    .104    .048    .078    .169    .182    .213    .216    .219    .200
H2  .156    .129    .082
```

```
T1      0
T2    0.0                                     2
T3.00001

A1                                      HILLSBORO + C-14
A2        JAY G FOY   CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
A3                      PLAN SCENARIO LAND USES WEST HILL + BP C-14 URBAN
B1        1         0         1         0         1         0
B2       10         1        12    621201        12
C1 BOCA RATON RAINFALL                           11         0   630101   741231        1
E1 HIL+C14                    5       4.6   .000001
E274918           .2       .525        1.         0
E3        .1      .104      .048      .078      .169      .182      .213      .216      .219      .200
E3      .156      .129      .082
F1SINGLE       86.15      22.7      100.     99999
F2         5.  .000001   .000001      .446     .0562     .0117
F1MULTPL        3.40      65.0      100.     99999
F2         5.  .000001   .000001     1.055     .2341     .0383
F1COMMCL        2.02      84.6      100.     99999
F2         5.  .000001   .000001     4.478     .3122     .1066
F1INDSTL        4.09      65.6      100.     99999
F2         5.  .000001   .000001     1.758     .4948     .0689
F1OPEN          4.34      19.6      100.     99999
I1OPEN          4.34      19.6      100.     99999
F2         5.  .000001   .000001      .122     .0758    .00244
                                                                                .46
H1.00001         .23        1.         0
H2        .3      .104      .048      .078      .169      .182      .213      .216      .219      .200
H2      .156      .129      .082
J1 3.569       .3569     .0114    .01309   .000508
T1      0
T2    0.0                                     2
T3.00001

HIL+C14           103.        43.        77.       162.       180.       203.       214.
HIL+C14           216.       191.       154.       124.        81.    SWETH
HIL+C14           944.       397.       704.      1484.      1648.      1867.      1960.
HIL+C14          1984.      1756.      1411.      1134.       742.    SWETF
   .144                                                               RIFI
HIL+C14 63       3913.     14073.      5349.      1382.      5155.      8184.      5905.
HIL+C14          7876.     20682.     26652.      8618.      3995.    DISH
HIL+C14 64      20097.     15894.      5702.      5373.     13599.     24746.      6206.
HIL+C14         20862.     15400.     44041.     15592.     13258.    DISH
HIL+C14 65        970.      8410.      3098.       950.       313.     12698.     28580.
HIL+C14         18468.     15640.     77369.     37966.      6611.    DISH
HIL+C14 66      18625.     23633.     10217.      1847.      7688.     66050.     58350.
IIL+C14 66      18625.     23633.     10217.      1847.      7688.     66050.     58350.
HIL+C14         16786.     20158.     54137.      9999.      2398.    DISH
HIL+C14 67       8303.      7307.      4776.       167.       186.     59865.     25033.
HIL+C14         22126.     16776.     45832.      6928.      5006.    DISH
HIL+C14 68       2198.      3045.       353.        40.     49192.     76897.     47540.
HIL+C14         19936.     33900.     67099.      9334.       516.    DISH
HIL+C14 69      11355.      5615.     18571.      7694.     21695.     44287.     25507.
HIL+C14         36252.     27223.     32577.     40980.     27380.    DISH
HIL+C14 70      19365.     15612.     52042.     10834.     17264.     35601.     38588.
HIL+C14         10863.     16570.     22931.       347.          0    DISH
HIL+C14 71         40.       264.          0          0      5919.      2999.      1462.
HIL+C14          3661.     17270.     18629.     21471.      5169.    DISH
HIL+C14 72       4911.      6627.      4645.     11272.     20892.     34957.     32670.
HIL+C14         22433.     15372.     12833.     16120.      9118.    DISH
HIL+C14 73       5996.      3596.      4149.       238.       732.     10693.     36847.
HIL+C14         45640.     43636.     17387.     22945.      6272.    DISH
IIL+C14         45640.     43636.     17387.     22945.      6272.    DISH
HIL+C14 74      33160.      3441.       579.       502.       863.     11566.     22806.
HIL+C14         26075.     11103.     42500.     11480.      6742.    DISH
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135

I-66

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HIL+C14                                                              ONPSCNSS
HIL+C14
HIL+C14                                                              ONPSCNBOD
HIL+C14     1.24      1.20      1.20      1.20      1.20      1.30        2.86
HIL+C14     2.26      1.21      2.07      1.20      1.28           ONPSCNN
HIL+C14     .048      .050      .050      .050      .050      .050        .069
HIL+C14     .276      .179      .431      .100      .180           ONPSCNP
HIL+C14      0.0       0.0      .227      .227                     REFF

          AJYQMGL.   76/12/04.FLORIDA STATE UNIVERSITY KRONOS

16.50.13.JGF,T550,CM120000,MO.   FOY
16.50.13.ACCOUNT,9364003,.
16.50.13.STAGEI,RI1098,7782/+3,TAPE11.
16.54.26.MT51, ASSIGNED TO STAGEIN, VSN=****51.
16.54.34. STAGING COMPLETE.
16.54.34.CALL,PROG1.
16.54.35.CBR,,CARDS.
16.54.36. COPY COMPLETE.
16.54.36.CBR,,CARD2.
16.54.36. COPY COMPLETE.
16.54.36.CBR,,IP1.
16.54.36. COPY COMPLETE.
16.54.36.CBR,,IP2.
16.54.36.CBR,,IP2.
16.54.36. COPY COMPLETE.
16.54.36.CBR,,IP3.
16.54.36. COPY COMPLETE.
16.54.36.G,STORM,SUMMB.
16.54.41.CALL (PROG2(LFN=LAND,NAME=IP1)
16.54.42.RA,INPUT.
16.54.42.ASSIGN,MS,OUTPUT.
16.54.42.DI00, ASSIGNED TO OUTPUT.
16.54.43.STORM(IP1)
17.00.33.STOP
17.00.33.RENAME,QUAL=TAPE13.
17.00.33.RENAME,OUT=OUTPUT.
17.00.33.RA,INPUT.
17.00.34.SUMMB.
17.03.01.STOP
17.03.02.RENAME,LAND=QUALSUM.
17.03.02.DISPOSE,QUAL=PR/EI=9364003.
17.03.03.RT,OUT.
17.03.03.CALL (PROG2(LFN=SCENAR,NAME=IP2)
17.03.03.RA,INPUT.
17.03.04.ASSIGN,MS,OUTPUT.
17.03.04.DI00, ASSIGNED TO OUTPUT.
17.03.05.STORM(IP2)
17.06.07.STOP
17.06.07.RENAME,QUAL=TAPE13.
17.06.07.RENAME,OUT=OUTPUT.
17.06.07.RA,INPUT.
17.06.36.SUMMB.
17.08.21.STOP
17.08.22.RENAME,SCENAR=QUALSUM.
17.08.22.DISPOSE,QUAL=PR/EI=9364003.
17.08.23.RT,OUT.
17.08.23.CALL (PROG2(LFN=SCENARU,NAME=IP3)
17.08.23.CALL (PROG2(LFN=SCENARU,NAME=IP3)
17.08.24.RA,INPUT.
17.08.25.ASSIGN,MS,OUTPUT.
17.08.25.DI00, ASSIGNED TO OUTPUT.
```

EXHIBIT 7.11: CLADM Hydrologic Output for Western C-14 Using 1973-74 Land Uses and Planned Scenario.

## HILLSBORO + C-14 BASIN

| | | 73-74 LAND USES | | | | | | * SCENARIO LAND USES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RAINFALL | DISCHARGE | RUNOFF | SWET | DSET | NGWL | NGWL | RUNOFF | DSET | SWET | DISCHARGE |
| 63 | 1 | 15497 | 3913 | 2405 | 103 | 6083 | 5398 | 4719 | 3140 | 4443 | 944 | 5391 |
| ■3 | 1 | 15497 | 3913 | 2405 | 103 | 6083 | 5398 | 4719 | 3140 | 4443 | 944 | 5391 |
| 63 | 2 | 41282 | 14073 | 9151 | 43 | 5455 | 21711 | 18978 | 10688 | 3649 | 397 | 18258 |
| 63 | 3 | 31596 | 5349 | 6814 | 77 | 4922 | 21248 | 18573 | 7949 | 3606 | 704 | 8713 |
| 63 | 4 | 6212 | 1382 | 1136 | 162 | 1767 | 2901 | 2536 | 1336 | 1508 | 1484 | 684 |
| 63 | 5 | 86906 | 5155 | 19906 | 180 | 8976 | 72595 | 63457 | 22979 | 5995 | 1648 | 15806 |
| 63 | 6 | 49899 | 8184 | 8417 | 203 | 16949 | 24563 | 21471 | 10688 | 12266 | 1867 | 14295 |
| 63 | 7 | 13493 | 5905 | 935 | 214 | 9832 | -2458 | -2812 | 1870 | 6908 | 1960 | 7437 |
| 63 | 8 | 36272 | 7876 | 7148 | 216 | 8290 | 19890 | 17386 | 8350 | 6871 | 1984 | 10031 |
| 63 | 9 | 83566 | 20682 | 17835 | 191 | 13743 | 48950 | 42788 | 20574 | 11122 | 1756 | 27900 |
| 63 | 10 | 47494 | 26652 | 10287 | 154 | 7222 | 13466 | 11771 | 11957 | 5392 | 1411 | 28920 |
| 63 | 11 | 16165 | 8618 | 2806 | 124 | 5182 | 2241 | 1959 | 3474 | 3935 | 1134 | 9137 |
| 63 | 12 | 24983 | 3995 | 5478 | 81 | 3539 | 17368 | 15182 | 6480 | 2168 | 742 | 6891 |
| | | 453365 | 111784 | 92318 | 1748 | 91960 | 247873 | 216009 | 109485 | 67863 | 16031 | 153462 |
| ■ | | 453365 | 111784 | 92318 | 1748 | 91960 | 247873 | 216009 | 109485 | 67863 | 16031 | 153462 |
| 64 | 1 | 12358 | 20097 | 2271 | 103 | 3467 | -11309 | -12937 | 2939 | 2009 | 944 | 22342 |
| 64 | 2 | 25517 | 15894 | 5411 | 43 | 4335 | 5245 | 4585 | 6413 | 2937 | 397 | 17598 |
| 64 | 3 | 21376 | 5702 | 4676 | 77 | 3070 | 12527 | 10950 | 5544 | 1854 | 704 | 7868 |
| 64 | 4 | 29124 | 5373 | 6146 | 162 | 5066 | 18523 | 16191 | 7281 | 3487 | 1484 | 7962 |
| 64 | 5 | 41415 | 13599 | 8016 | 180 | 10034 | 17602 | 15386 | 10087 | 5899 | 1648 | 18482 |
| 64 | 6 | 52972 | 24746 | 10755 | 203 | 10869 | 17154 | 14995 | 12558 | 8753 | 1867 | 27357 |
| 64 | 7 | 35470 | 6206 | 6012 | 214 | 11934 | 17116 | 14962 | 7482 | 9127 | 1960 | 9421 |
| 64 | 8 | 52705 | 20862 | 11489 | 216 | 7725 | 23902 | 20893 | 13427 | 5428 | 1984 | 24400 |
| 64 | 9 | 42150 | 15400 | 7415 | 191 | 13123 | 13436 | 11745 | 9419 | 8986 | 1756 | 19663 |
| 64 | 10 | 74347 | 44041 | 16833 | 154 | 8447 | 21705 | 18973 | 19372 | 6138 | 1411 | 47825 |
| 64 | 11 | 4208 | 15592 | 200 | 124 | 3424 | -14932 | -17082 | 401 | 2797 | 1134 | 17359 |
| ■4 | 11 | 4208 | 15592 | 200 | 124 | 3424 | -14932 | -17082 | 401 | 2797 | 1134 | 17359 |
| 64 | 12 | 12892 | 13258 | 2204 | 81 | 4262 | -4709 | -5387 | 3006 | 2308 | 742 | 15229 |
| | | 404534 | 200770 | 81428 | 1748 | 85756 | 116260 | 93273 | 97929 | 59723 | 16031 | 235507 |
| 65 | 1 | 4876 | 970 | 468 | 103 | 3046 | 757 | 662 | 735 | 2289 | 944 | 981 |
| 65 | 2 | 35070 | 8410 | 7348 | 43 | 6303 | 20314 | 17757 | 8817 | 4022 | 397 | 12894 |
| 65 | 3 | 6480 | 3098 | 735 | 77 | 3603 | -298 | -341 | 1136 | 2481 | 704 | 3636 |
| 65 | 4 | 4743 | 950 | 868 | 162 | 1343 | 2288 | 2000 | 1136 | 744 | 1484 | 515 |
| 65 | 5 | 8149 | 313 | 1136 | 180 | 3704 | 3952 | 3455 | 1536 | 2740 | 1648 | 306 |
| 65 | 6 | 72878 | 12698 | 15698 | 203 | 11423 | 48554 | 42442 | 18303 | 8431 | 1867 | 20138 |
| 65 | 7 | 73546 | 28580 | 15297 | 214 | 13660 | 31092 | 27178 | 18169 | 9570 | 1960 | 34838 |
| 65 | 8 | 22979 | 18468 | 3273 | 216 | 10165 | -5870 | -6715 | 4476 | 7220 | 1984 | 20490 |
| 65 | 9 | 27788 | 15640 | 4476 | 191 | 10267 | 1690 | 1477 | 5878 | 7090 | 1756 | 17465 |
| 65 | 10 | 197993 | 77369 | 48429 | 154 | 8398 | 112072 | 97965 | 54642 | 5594 | 1411 | 93023 |
| ■5 | 10 | 197993 | 77369 | 48429 | 154 | 8398 | 112072 | 97965 | 54642 | 5594 | 1411 | 93023 |
| 65 | 11 | 26319 | 37966 | 5344 | 124 | 5398 | -17169 | -19641 | 6480 | 3504 | 1134 | 41322 |
| 65 | 12 | 6747 | 6611 | 868 | 81 | 3347 | -3292 | -3766 | 1202 | 2513 | 742 | 7258 |
| | | 487568 | 211073 | 103940 | 1748 | 80657 | 194090 | 162473 | 122510 | 56198 | 16031 | 252866 |
| 66 | 1 | 21843 | 18625 | 3407 | 103 | 8506 | -5391 | -6167 | 4609 | 5614 | 944 | 21452 |
| 66 | 2 | 38677 | 23633 | 9352 | 43 | 2065 | 12936 | 11308 | 10554 | 1514 | 397 | 25458 |
| 66 | 3 | 12358 | 10217 | 2071 | 77 | 4251 | -2187 | -2502 | 2472 | 3655 | 704 | 10501 |
| 66 | 4 | 11089 | 1847 | 1670 | 162 | 4551 | 4529 | 3959 | 2271 | 3092 | 1484 | 2554 |
| 66 | 5 | 32932 | 7688 | 5611 | 180 | 10965 | 14099 | 12324 | 6880 | 8706 | 1648 | 10254 |
| 66 | 6 | 110285 | 66050 | 29325 | 203 | -4517 | 48549 | 42438 | 34268 | -10376 | 1867 | 76356 |
| 66 | 7 | 50968 | 58350 | 3874 | 214 | 35800 | -43396 | -49645 | 5277 | 32396 | 1960 | 66267 |

138

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| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ■6 8 | 41 | 16786 | 6680 | 216 | 15131 | 9143 | 7997 | 8483 | 11411 | 1984 | 19890 |
| 66 9 | 55[illegible] | 20158 | 10688 | 191 | 13735 | 21493 | 18788 | 13093 | 9476 | 1756 | 25557 |
| 66 10 | 46425 | 54137 | 9953 | 154 | 7460 | -15326 | -17533 | 11623 | 5499 | 1411 | 57048 |
| 66 11 | 7081 | 9999 | 601 | 124 | 4727 | -7769 | -8888 | 868 | 4023 | 1134 | 10812 |
| 66 12 | 6680 | 2398 | 334 | 81 | 5372 | -1171 | -1340 | 802 | 3857 | 742 | 3421 |
| | 435197 | 289888 | 83566 | 1748 | 108046 | 35515 | 10739 | 101200 | 78857 | 16031 | 329570 |
| 67 1 | 16099 | 8303 | 2138 | 103 | 7730 | -37 | -42 | 2939 | 5750 | 944 | 9447 |
| 67 2 | 15631 | 7307 | 2872 | 43 | 4386 | 3895 | 3405 | 3474 | 3400 | 397 | 8429 |
| 67 3 | 23847 | 4776 | 4743 | 77 | 5280 | 13714 | 11988 | 5611 | 4090 | 704 | 7065 |
| 67 4 | 0 | 167 | 0 | 162 | 0 | -329 | -376 | 0 | 0 | 1484 | 0 |
| 67 5 | 13827 | 186 | 2204 | 180 | 5198 | 8263 | 7223 | 2872 | 3714 | 1648 | 134 |
| 67 6 | 79224 | 59865 | 15564 | 203 | 18292 | 864 | 755 | 18971 | 12425 | 1867 | 64177 |
| 67 7 | 24782 | 25033 | 3273 | 214 | 11969 | -12434 | -14224 | 4476 | 9024 | 1960 | 28022 |
| ■7 7 | 24782 | 25033 | 3273 | 214 | 11969 | -12434 | -14224 | 4476 | 9024 | 1960 | 28022 |
| 67 8 | 45624 | 22126 | 7615 | 216 | 15812 | 7470 | 6530 | 9886 | 10813 | 1984 | 26297 |
| 67 9 | 49498 | 16776 | 8751 | 191 | 15240 | 17291 | 15115 | 10755 | 11630 | 1756 | 20997 |
| 67 10 | 36205 | 45832 | 6814 | 154 | 9531 | -19312 | -22093 | 8283 | 7040 | 1411 | 49847 |
| 67 11 | 24782 | 6928 | 5010 | 124 | 5169 | 12561 | 10980 | 6012 | 3614 | 1134 | 9054 |
| 67 12 | 11089 | 5006 | 1603 | 81 | 4812 | 1190 | 1040 | 2271 | 3092 | 742 | 6215 |
| | 340608 | 202305 | 60587 | 1748 | 103419 | 33136 | 20299 | 75550 | 74592 | 16031 | 229686 |
| 68 1 | 8417 | 2198 | 1336 | 103 | 3187 | 2929 | 2560 | 1670 | 2537 | 944 | 2376 |
| 68 2 | 17368 | 3045 | 2872 | 43 | 6123 | 8157 | 7130 | 3607 | 4667 | 397 | 5174 |
| 68 3 | 13360 | 353 | 2338 | 77 | 4207 | 8723 | 7625 | 3006 | 2776 | 704 | 2255 |
| 68 4 | 6012 | 40 | 1002 | 162 | 2089 | 3721 | 3253 | 1269 | 1543 | 1484 | 0 |
| 68 5 | 82831 | 49192 | 16700 | 180 | 17454 | 16005 | 13990 | 19839 | 12975 | 1648 | 53950 |
| 68 6 | 100733 | 76897 | 23046 | 203 | 10512 | 13121 | 11469 | 26586 | 7121 | 1867 | 80276 |
| ■8 6 | 100733 | 76897 | 23046 | 203 | 10512 | 13121 | 11469 | 26586 | 7121 | 1867 | 80276 |
| 68 7 | 44021 | 47540 | 9485 | 214 | 6886 | -10619 | -12148 | 11155 | 4741 | 1960 | 49468 |
| 68 8 | 42751 | 19936 | 8216 | 216 | 10586 | 12013 | 10501 | 10153 | 7000 | 1984 | 23266 |
| 68 9 | 88175 | 33900 | 18837 | 191 | 14429 | 39655 | 34663 | 22044 | 10557 | 1756 | 41199 |
| 68 10 | 43419 | 67099 | 8751 | 154 | 9162 | -32996 | -37747 | 10087 | 7903 | 1411 | 71852 |
| 68 11 | 9819 | 9334 | 1603 | 124 | 3543 | -3182 | -3640 | 2138 | 2293 | 1134 | 10032 |
| 68 12 | 3340 | 516 | 468 | 81 | 1509 | 1234 | 1079 | 735 | 753 | 742 | 766 |
| | 460246 | 310050 | 94654 | 1748 | 89687 | 58761 | 38735 | 112289 | 64866 | 16031 | 340614 |
| 69 1 | 31396 | 11355 | 6680 | 103 | 5245 | 14693 | 12844 | 7949 | 3406 | 944 | 14202 |
| 69 2 | 11356 | 5615 | 2538 | 43 | 1418 | 4280 | 3741 | 3006 | 772 | 397 | 6446 |
| 69 3 | 40079 | 18571 | 8016 | 77 | 8698 | 12733 | 11130 | 9619 | 6210 | 704 | 22035 |
| 69 4 | 8016 | 7694 | 534 | 162 | 5924 | -5764 | -6594 | 1069 | 4253 | 1484 | 8873 |
| 69 5 | 24716 | 21695 | 3140 | 180 | 12425 | -9584 | -10964 | 4275 | 9662 | 1648 | 24370 |
| ■9 5 | 24716 | 21695 | 3140 | 180 | 12425 | -9584 | -10964 | 4275 | 9662 | 1648 | 24370 |
| 69 6 | 92183 | 44287 | 19439 | 203 | 16084 | 31609 | 27630 | 22645 | 12448 | 1867 | 50238 |
| 69 7 | 53439 | 25507 | 9619 | 214 | 15782 | 11936 | 10434 | 11957 | 11337 | 1960 | 29708 |
| 69 8 | 32732 | 36252 | 5210 | 216 | 12334 | -16070 | -18384 | 6546 | 9681 | 1984 | 39451 |
| 69 9 | 67467 | 27223 | 12224 | 191 | 19611 | 20442 | 17869 | 14963 | 14781 | 1756 | 33061 |
| 69 10 | 22712 | 32577 | 3073 | 154 | 10682 | -20701 | -23682 | 4142 | 8129 | 1411 | 36854 |
| 69 11 | 9819 | 40980 | 1603 | 124 | 3543 | -34828 | -39843 | 2138 | 2293 | 1134 | 46235 |
| 69 12 | 3340 | 27380 | 534 | 81 | 1248 | -25369 | -29022 | 735 | 753 | 742 | 30867 |
| | 397255 | 299136 | 72610 | 1748 | 112994 | -16623 | -44842 | 89044 | 83725 | 16031 | 342341 |
| 70 1 | 27388 | 19365 | 5611 | 103 | 5421 | 2499 | 2184 | 6680 | 3867 | 944 | 20393 |
| 70 2 | 22712 | 15612 | 4810 | 43 | 3883 | 3174 | 2774 | 5812 | 2249 | 397 | 17292 |
| 70 3 | 64127 | 52042 | 14562 | 77 | 7118 | 4890 | 4274 | 16833 | 4855 | 704 | 54294 |
| ■0 3 | 64127 | 52042 | 14562 | 77 | 7118 | 4890 | 4274 | 16833 | 4855 | 704 | 54294 |
| 70 4 | 0 | 10834 | 0 | 162 | 0 | -10996 | -12579 | 0 | 0 | 1484 | 11095 |
| 70 5 | 30728 | 17264 | 6012 | 180 | 7192 | 6092 | 5325 | 6947 | 6266 | 1648 | 17489 |
| 70 6 | 82163 | 35601 | 17101 | 203 | 15216 | 31143 | 27223 | 20173 | 11131 | 1867 | 41942 |
| 70 7 | 42017 | 38588 | 9018 | 214 | 6713 | -3498 | -4002 | 10487 | 5089 | 1960 | 38970 |
| 70 8 | 33466 | 10863 | 6480 | 216 | 8100 | 14287 | 12489 | 7882 | 5712 | 1984 | 13281 |
| 70 9 | 33400 | 16570 | 5611 | 191 | 11433 | 5206 | 4551 | 7348 | 7527 | 1756 | 19566 |
| 70 10 | 16032 | 22931 | 1603 | 154 | 9756 | -16809 | -19229 | 2138 | 8505 | 1411 | 25345 |
| 70 11 | 4008 | 347 | 134 | 124 | 3485 | 52 | 45 | 401 | 2597 | 1134 | 232 |
| 70 12 | 3407 | 0 | 134 | 81 | 2884 | 442 | 386 | 401 | 1996 | 742 | 283 |

139

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71 | 1 | 9617 | 40 | 1670 | 103 | 3081 | 6395 | 5590 | 2204 | 1857 | 944 | 1228 |
| 71 | 2 | 9352 | 264 | 1269 | 43 | 4383 | 4662 | 4075 | 1804 | 3001 | 397 | 1879 |
| ■1 | 2 | 9352 | 264 | 1269 | 43 | 4383 | 4662 | 4075 | 1804 | 3001 | 397 | 1879 |
| 71 | 3 | 2672 | 0 | 134 | 77 | 2149 | 446 | 390 | 334 | 1496 | 704 | 82 |
| 71 | 4 | 4676 | 0 | 668 | 162 | 2061 | 2453 | 2144 | 935 | 1383 | 1484 | 0 |
| 71 | 5 | 36740 | 5919 | 6747 | 180 | 10327 | 20314 | 17757 | 8283 | 7574 | 1648 | 9426 |
| 71 | 6 | 34068 | 2999 | 4810 | 203 | 15239 | 15627 | 13660 | 6613 | 10782 | 1867 | 7759 |
| 71 | 7 | 18036 | 1462 | 2204 | 214 | 9406 | 6954 | 6079 | 2939 | 7687 | 1960 | 2310 |
| 71 | 8 | 26052 | 3661 | 3674 | 216 | 11669 | 10506 | 9184 | 4943 | 8646 | 1984 | 6238 |
| 71 | 9 | 46091 | 17270 | 8684 | 191 | 12095 | 16535 | 14454 | 10487 | 9164 | 1756 | 20717 |
| 71 | 10 | 39412 | 18629 | 7081 | 154 | 11691 | 8938 | 7813 | 8617 | 9070 | 1411 | 21118 |
| 71 | 11 | 22044 | 21471 | 4142 | 124 | 5830 | -5381 | -6156 | 4810 | 5109 | 1134 | 21957 |
| 71 | 12 | 17368 | 5169 | 3340 | 81 | 4292 | 7826 | 6841 | 4008 | 3255 | 742 | 6530 |
| | | 266130 | 76884 | 44423 | 1748 | 92223 | 95275 | 81830 | 55977 | 69024 | 16031 | 99245 |
| 72 | 1 | 15364 | 4911 | 2338 | 103 | 6211 | 4139 | 3618 | 3006 | 4780 | 944 | 6022 |
| ■2 | 1 | 15364 | 4911 | 2338 | 103 | 6211 | 4139 | 3618 | 3006 | 4780 | 944 | 6022 |
| 72 | 2 | 17368 | 6627 | 3340 | 43 | 4292 | 6406 | 5600 | 4142 | 2785 | 397 | 8586 |
| 72 | 3 | 37408 | 4645 | 8751 | 77 | 3150 | 29536 | 25818 | 10020 | 2127 | 704 | 8759 |
| 72 | 4 | 18704 | 11272 | 2605 | 162 | 8505 | -1235 | -1413 | 3540 | 6238 | 1484 | 12395 |
| 72 | 5 | 36072 | 20892 | 5144 | 180 | 15935 | -935 | -1070 | 7014 | 11375 | 1648 | 24119 |
| 72 | 6 | 74815 | 34957 | 13627 | 203 | 21467 | 18188 | 15899 | 16767 | 15778 | 1867 | 41271 |
| 72 | 7 | 62123 | 32670 | 12024 | 214 | 15051 | 14188 | 12402 | 14629 | 10613 | 1960 | 37148 |
| 72 | 8 | 18704 | 22433 | 2071 | 216 | 10597 | -14542 | -16636 | 3073 | 7884 | 1984 | 25472 |
| 72 | 9 | 18036 | 15372 | 2271 | 191 | 9144 | -6671 | -7632 | 2872 | 7922 | 1756 | 15990 |
| 72 | 10 | 30728 | 12833 | 6146 | 154 | 6669 | 11072 | 9678 | 7415 | 4620 | 1411 | 15019 |
| 72 | 11 | 46091 | 16120 | 9953 | 124 | 7126 | 22721 | 19861 | 11489 | 5636 | 1134 | 19460 |
| 72 | 12 | 12024 | 9118 | 1403 | 81 | 6532 | -3707 | -4241 | 1937 | 5203 | 742 | 10320 |
| | | 387437 | 191850 | 69673 | 1748 | 114679 | 79160 | 61885 | 85904 | 84961 | 16031 | 224560 |
| ■ | | 387437 | 191850 | 69673 | 1748 | 114679 | 79160 | 61885 | 85904 | 84961 | 16031 | 224560 |
| 73 | 1 | 11356 | 5996 | 1670 | 103 | 4818 | 439 | 384 | 2204 | 3594 | 944 | 6434 |
| 73 | 2 | 19706 | 3596 | 3474 | 43 | 6107 | 9960 | 8706 | 4409 | 4182 | 397 | 6421 |
| 73 | 3 | 13360 | 4149 | 2338 | 77 | 4207 | 4927 | 4307 | 3006 | 2776 | 704 | 5573 |
| 73 | 4 | 7348 | 238 | 601 | 162 | 4994 | 1954 | 1708 | 1136 | 3349 | 1484 | 807 |
| 73 | 5 | 19372 | 732 | 2872 | 180 | 8127 | 10333 | 9032 | 3741 | 6200 | 1648 | 2492 |
| 73 | 6 | 49765 | 10693 | 9552 | 203 | 12369 | 26500 | 23164 | 11556 | 9075 | 1867 | 15659 |
| 73 | 7 | 54775 | 36847 | 10755 | 214 | 12672 | 5042 | 4407 | 13026 | 8910 | 1960 | 39498 |
| 73 | 8 | 88175 | 45640 | 26653 | 216 | -16167 | 58486 | 51124 | 31128 | -21431 | 1984 | 56498 |
| 73 | 9 | 61455 | 43636 | 3808 | 191 | 46549 | -28921 | -33086 | 5478 | 42168 | 1756 | 50617 |
| 73 | 10 | 36072 | 17387 | 5878 | 154 | 13059 | 5472 | 4783 | 7548 | 9493 | 1411 | 20385 |
| 73 | 11 | 15364 | 22945 | 2071 | 124 | 7257 | -14962 | -17117 | 3006 | 4780 | 1134 | 26567 |
| 73 | 12 | 16032 | 6272 | 3006 | 81 | 4264 | 5415 | 4733 | 3741 | 2860 | 742 | 7697 |
| ■3 | 12 | 16032 | 6272 | 3006 | 81 | 4264 | 5415 | 4733 | 3741 | 2860 | 742 | 7697 |
| | | 392780 | 198131 | 72678 | 1748 | 108256 | 84645 | 62147 | 89979 | 75956 | 16031 | 238646 |
| 74 | 1 | 78957 | 33160 | 18837 | 103 | 5211 | 40483 | 35387 | 21443 | 3455 | 944 | 39171 |
| 74 | 2 | 0 | 3441 | 0 | 43 | 0 | -3484 | -3986 | 0 | 0 | 397 | 3589 |
| 74 | 3 | 11356 | 579 | 2405 | 77 | 1942 | 8758 | 7656 | 2806 | 1477 | 704 | 1519 |
| 74 | 4 | 4676 | 502 | 534 | 162 | 2584 | 1428 | 1248 | 868 | 1618 | 1484 | 326 |
| 74 | 5 | 18704 | 863 | 2739 | 180 | 7982 | 9679 | 8461 | 3540 | 6238 | 1648 | 2357 |
| 74 | 6 | 34068 | 11566 | 5277 | 203 | 13408 | 8891 | 7772 | 6880 | 9841 | 1867 | 14588 |
| 74 | 7 | 50767 | 22806 | 8617 | 214 | 17033 | 10714 | 9365 | 10955 | 12193 | 1960 | 27249 |
| 74 | 8 | 22177 | 26075 | 3540 | 216 | 8317 | -12431 | -14221 | 4609 | 5948 | 1984 | 28466 |
| 74 | 9 | 36740 | 11103 | 6546 | 191 | 11112 | 14334 | 12530 | 8016 | 8515 | 1756 | 13939 |
| 74 | 10 | 80159 | 42500 | 19171 | 154 | 5106 | 32399 | 28321 | 21843 | 3246 | 1411 | 47181 |
| 74 | 11 | 54775 | 11480 | 11690 | 124 | 9011 | 34160 | 29860 | 13827 | 6088 | 1134 | 17693 |
| ■4 | 11 | 54775 | 11480 | 11690 | 124 | 9011 | 34160 | 29860 | 13827 | 6088 | 1134 | 17693 |
| 74 | 12 | 2672 | 6742 | 134 | 81 | 2149 | -6300 | -7207 | 334 | 1496 | 742 | 7641 |
| | | 395051 | 170817 | 79490 | 1748 | 83855 | 138631 | 115186 | 95121 | 60115 | 16031 | 203719 |

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EXHIBIT 7.12: CLADM Quality Output for Western C-14 Using 1973-74 Land Uses

73-74 LAND USES
HILLSBORO + C-14 BASINS

| | TLSS | TLBOD | TLN | TLP | TCSS | TCBOD | TCN | TCP |
|---|---|---|---|---|---|---|---|---|
| 63 1 | 193614 | 28457 | 13822 | 1071 | 18.21 | 2.68 | 1.30 | .101 |
| 13 1 | 193614 | 28457 | 13822 | 1071 | 18.21 | 2.68 | 1.30 | .101 |
| 63 2 | 1198745 | 21202 | 25136 | 1364 | 31.34 | .55 | .66 | .036 |
| 63 3 | 1027948 | 20211 | 10294 | 691 | 70.71 | 1.39 | .71 | .048 |
| 63 4 | 285953 | 7325 | 3628 | 268 | 76.13 | 1.95 | .97 | .071 |
| 63 5 | 544631 | 13510 | 8412 | 487 | 38.87 | .96 | .60 | .035 |
| 63 6 | 2145541 | 21607 | 11510 | 749 | 96.46 | .97 | .52 | .034 |
| 63 7 | 149899 | 15706 | 43560 | 1415 | 9.34 | .98 | 2.71 | .088 |
| 63 8 | 850401 | 21578 | 15255 | 1281 | 39.73 | 1.01 | .71 | .060 |
| 63 9 | 3005926 | 34128 | 31488 | 2632 | 53.48 | .61 | .56 | .047 |
| 63 10 | 589857 | 15586 | 100473 | 19708 | 8.14 | .22 | 1.39 | .272 |
| 63 11 | 921730 | 15646 | 25749 | 2094 | 39.35 | .67 | 1.10 | .089 |
| 63 12 | 560662 | 25260 | 10485 | 822 | 51.64 | 2.33 | .97 | .076 |
| | 11474908 | 240215 | 299812 | 32581 | 37.77 | .79 | .99 | .107 |
| 64 1 | 813419 | 13992 | 66122 | 2784 | 14.89 | .26 | 1.21 | .051 |
| 64 2 | 2139841 | 24309 | 46472 | 2253 | 49.54 | .56 | 1.08 | .052 |
| 64 3 | 1045801 | 25108 | 18070 | 1029 | 67.49 | 1.62 | 1.17 | .066 |
| 14 3 | 1045801 | 25108 | 18070 | 1029 | 67.49 | 1.62 | 1.17 | .066 |
| 64 4 | 1412287 | 32905 | 19401 | 1168 | 96.71 | 2.25 | 1.33 | .080 |
| 64 5 | 3482612 | 28447 | 37406 | 1809 | 94.23 | .77 | 1.01 | .049 |
| 64 6 | 2896974 | 32914 | 70939 | 3104 | 43.08 | .49 | 1.05 | .046 |
| 64 7 | 1166323 | 24400 | 16321 | 909 | 69.15 | 1.45 | .97 | .054 |
| 64 8 | 1746328 | 38600 | 82801 | 8445 | 30.80 | .68 | 1.46 | .149 |
| 64 9 | 2108157 | 26183 | 41447 | 4811 | 50.37 | .63 | .99 | .115 |
| 64 10 | 3015315 | 37388 | 178601 | 33257 | 25.19 | .31 | 1.49 | .278 |
| 64 11 | 17064 | 7837 | 52517 | 4422 | .40 | .18 | 1.24 | .104 |
| 64 12 | 508130 | 25775 | 47182 | 6212 | 14.10 | .72 | 1.31 | .172 |
| | 20352251 | 317858 | 677279 | 70203 | 37.30 | .58 | 1.24 | .129 |
| 65 1 | 91187 | 6866 | 3909 | 278 | 34.59 | 2.60 | 1.48 | .106 |
| 65 2 | 1116940 | 33240 | 18285 | 1242 | 48.87 | 1.45 | .80 | .054 |
| 65 3 | 144570 | 13144 | 11878 | 726 | 17.17 | 1.56 | 1.41 | .086 |
| 65 4 | 447421 | 20524 | 7321 | 653 | 173.29 | 7.95 | 2.84 | .253 |
| 65 5 | 181716 | 3756 | 1535 | 122 | 213.62 | 4.42 | 1.80 | .143 |
| 15 5 | 181716 | 3756 | 1535 | 122 | 213.62 | 4.42 | 1.80 | .143 |
| 65 6 | 1275186 | 45173 | 33992 | 1730 | 36.95 | 1.31 | .98 | .050 |
| 65 7 | 3963378 | 36478 | 125949 | 3808 | 51.03 | .47 | 1.62 | .049 |
| 65 8 | 797599 | 18678 | 100702 | 11998 | 15.89 | .37 | 2.01 | .239 |
| 65 9 | 1242140 | 17001 | 44681 | 6001 | 29.22 | .40 | 1.05 | .141 |
| 65 10 | 1518434 | 38045 | 187325 | 35285 | 7.22 | .18 | .89 | .168 |
| 65 11 | 816669 | 14807 | 112685 | 9349 | 7.91 | .14 | 1.09 | .091 |
| 65 12 | 281301 | 18768 | 26118 | 3391 | 15.66 | 1.04 | 1.45 | .189 |
| | 11876541 | 266481 | 674379 | 74585 | 20.70 | .46 | 1.18 | .130 |
| 66 1 | 1229632 | 23278 | 61047 | 2743 | 24.29 | .46 | 1.21 | .054 |
| 66 2 | 1466238 | 24460 | 62136 | 2829 | 22.83 | .38 | .97 | .044 |
| 66 3 | 924734 | 15892 | 33439 | 1629 | 33.30 | .57 | 1.20 | .059 |
| 66 4 | 622476 | 22823 | 8727 | 743 | 124.01 | 4.55 | 1.74 | .148 |
| 66 5 | 3032293 | 29320 | 22689 | 1300 | 145.13 | 1.40 | 1.09 | .062 |
| 66 6 | 2534589 | 43211 | 163125 | 6659 | 14.12 | .24 | .91 | .037 |
| 66 7 | 758356 | 17959 | 430502 | 10795 | 4.78 | .11 | 2.71 | .068 |
| 16 7 | 758356 | 17959 | 430502 | 10795 | 4.78 | .11 | 2.71 | .068 |
| 66 8 | 2527100 | 22299 | 74715 | 8364 | 55.39 | .49 | 1.64 | .183 |
| 66 9 | 3958726 | 32261 | 52609 | 5796 | 72.26 | .59 | .96 | .106 |
| 66 10 | 1229634 | 28625 | 267204 | 52804 | 8.36 | .19 | 1.82 | .359 |
| 66 11 | 134508 | 15125 | 35373 | 3019 | 4.95 | .56 | 1.30 | .111 |
| 66 12 | 72296 | 18113 | 12619 | 1564 | 11.09 | 2.78 | 1.94 | .240 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 67 | 1 | 1150794 | 21777 | 29909 | 1514 | 51.00 | .97 | 1.33 | .067 |
| 67 | 2 | 725089 | 22016 | 25068 | 1344 | 36.51 | 1.11 | 1.26 | .068 |
| 67 | 3 | 1476955 | 30633 | 17488 | 1081 | 113.79 | 2.36 | 1.35 | .083 |
| 67 | 4 | 0 | 0 | 545 | 23 | 0.00 | 0.00 | 1.20 | .050 |
| 67 | 5 | 94204 | 3180 | 1360 | 104 | 186.35 | 6.29 | 2.69 | .206 |
| 67 | 6 | 4724772 | 57794 | 201911 | 8267 | 29.04 | .36 | 1.24 | .051 |
| 67 | 7 | 1456469 | 19130 | 178249 | 4724 | 21.41 | .28 | 2.62 | .069 |
| 67 | 8 | 4132203 | 33015 | 108798 | 12062 | 68.72 | .55 | 1.81 | .201 |
| 67 | 9 | 2680909 | 30390 | 46636 | 5023 | 58.80 | .67 | 1.02 | .110 |
| ▮7 | 9 | 2680909 | 30390 | 46636 | 5023 | 58.80 | .67 | 1.02 | .110 |
| 67 | 10 | 2331686 | 22462 | 234161 | 46525 | 18.72 | .18 | 1.88 | .374 |
| 67 | 11 | 137611 | 19198 | 17046 | 1194 | 7.31 | 1.02 | .91 | .063 |
| 67 | 12 | 549901 | 24895 | 20412 | 2444 | 40.42 | 1.83 | 1.50 | .180 |
| | | 19460593 | 284490 | 881584 | 84305 | 35.39 | .52 | 1.60 | .153 |
| 68 | 1 | 622700 | 11723 | 7830 | 494 | 104.24 | 1.96 | 1.31 | .083 |
| 68 | 2 | 1527749 | 27815 | 12371 | 934 | 184.61 | 3.36 | 1.49 | .113 |
| 68 | 3 | 186107 | 2569 | 1200 | 86 | 193.99 | 2.68 | 1.25 | .090 |
| 68 | 4 | 21464 | 944 | 327 | 30 | 197.44 | 8.68 | 3.00 | .272 |
| 68 | 5 | 5017055 | 48902 | 142167 | 6279 | 37.53 | .37 | 1.06 | .047 |
| 68 | 6 | 3221473 | 25654 | 210450 | 8315 | 15.41 | .12 | 1.01 | .040 |
| 68 | 7 | 888888 | 7617 | 300178 | 7406 | 6.88 | .06 | 2.32 | .057 |
| 68 | 8 | 1004782 | 30513 | 83302 | 9760 | 18.54 | .56 | 1.54 | .180 |
| 68 | 9 | 3170890 | 33672 | 71930 | 8567 | 34.42 | .37 | .78 | .093 |
| 68 | 10 | 616496 | 14288 | 336348 | 68851 | 3.38 | .08 | 1.84 | .378 |
| 68 | 11 | 204930 | 13151 | 29534 | 2509 | 8.08 | .52 | 1.16 | .099 |
| ▮8 | 11 | 204930 | 13151 | 29534 | 2509 | 8.08 | .52 | 1.16 | .099 |
| 68 | 12 | 251285 | 19072 | 6321 | 613 | 179.19 | 13.60 | 4.51 | .437 |
| | | 16733819 | 235920 | 1201959 | 113844 | 19.86 | .28 | 1.43 | .135 |
| 69 | 1 | 1764293 | 33429 | 34649 | 1783 | 57.17 | 1.08 | 1.12 | .058 |
| 69 | 2 | 6924 | 21589 | 21203 | 1158 | .45 | 1.41 | 1.39 | .076 |
| 69 | 3 | 1793100 | 39115 | 57479 | 2824 | 35.53 | .77 | 1.14 | .056 |
| 69 | 4 | 222886 | 13348 | 27772 | 1388 | 10.66 | .64 | 1.33 | .066 |
| 69 | 5 | 2206966 | 26515 | 73600 | 3418 | 37.43 | .45 | 1.25 | .058 |
| 69 | 6 | 4112259 | 51608 | 129889 | 5411 | 34.17 | .43 | 1.08 | .045 |
| 69 | 7 | 3595250 | 32320 | 141655 | 4112 | 51.86 | .47 | 2.04 | .059 |
| 69 | 8 | 1354422 | 23959 | 203371 | 24110 | 13.75 | .24 | 2.06 | .245 |
| 69 | 9 | 4387810 | 37387 | 75765 | 8699 | 59.31 | .51 | 1.02 | .118 |
| 69 | 10 | 1611998 | 19835 | 175677 | 35230 | 18.21 | .22 | 1.98 | .398 |
| 69 | 11 | 792821 | 10179 | 133314 | 11045 | 7.12 | .09 | 1.20 | .099 |
| 69 | 12 | 375605 | 14862 | 98625 | 13600 | 5.05 | .20 | 1.33 | .183 |
| | | 22224334 | 324146 | 1172999 | 112778 | 27.34 | .40 | 1.44 | .139 |
| ▮ | | 22224334 | 324146 | 1172999 | 112778 | 27.34 | .40 | 1.44 | .139 |
| 70 | 1 | 1557836 | 42594 | 72283 | 3319 | 29.60 | .81 | 1.37 | .063 |
| 70 | 2 | 1636213 | 31886 | 55801 | 2631 | 38.56 | .75 | 1.32 | .062 |
| 70 | 3 | 1683082 | 58791 | 167812 | 7367 | 11.90 | .42 | 1.19 | .052 |
| 70 | 4 | 0 | 0 | 35333 | 1472 | 0.00 | 0.00 | 1.20 | .050 |
| 70 | 5 | 759021 | 53941 | 66415 | 3409 | 16.18 | 1.15 | 1.42 | .073 |
| 70 | 6 | 2438320 | 49179 | 102671 | 4403 | 25.20 | .51 | 1.06 | .046 |
| 70 | 7 | 1266287 | 18625 | 243221 | 6247 | 12.07 | .18 | 2.32 | .060 |
| 70 | 8 | 1430079 | 17156 | 35394 | 3868 | 48.44 | .58 | 1.20 | .131 |
| 70 | 9 | 999628 | 28397 | 46727 | 6234 | 22.20 | .3 | 1.04 | .138 |
| 70 | 10 | 483968 | 10517 | 124223 | 25322 | 7.77 | .17 | 1.99 | .496 |
| 70 | 11 | 0 | 6780 | 2665 | 264 | 0.00 | 7.19 | 2.83 | .280 |
| 70 | 12 | 0 | 0 | 0 | 0 | I | I | I | I |
| | | 12254434 | 317866 | 952544 | 64536 | 18.79 | .49 | 1.46 | .099 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 71 1 | 1040[illegible] | 749 | 243 | 23 | 95.75 | 6.89 | 2.24 | .213 |
| 71 2 | 621[illegible] | 3527 | 1176 | 110 | 86.65 | 4.92 | 1.64 | .153 |
| ■1 2 | 6216[illegible] | 3527 | 1176 | 110 | 86.65 | 4.92 | 1.64 | .153 |
| 71 3 | 0 | 0 | 0 | 0 | I | I | I | I |
| 71 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 71 5 | 2400701 | 33576 | 22028 | 1231 | 149.24 | 2.09 | 1.37 | .077 |
| 71 6 | 1066145 | 20107 | 11484 | 708 | 130.81 | 2.47 | 1.41 | .087 |
| 71 7 | 404045 | 13902 | 6643 | 467 | 101.69 | 3.50 | 1.67 | .118 |
| 71 8 | 3058213 | 27928 | 15574 | 977 | 307.36 | 2.81 | 1.57 | .098 |
| 71 9 | 4564930 | 33026 | 56284 | 5498 | 97.26 | .70 | 1.20 | .117 |
| 71 10 | 2707011 | 47531 | 95134 | 15252 | 53.47 | .94 | 1.88 | .301 |
| 71 11 | 1442656 | 14726 | 69192 | 5302 | 24.72 | .25 | 1.19 | .091 |
| 71 12 | 1361670 | 37542 | 25470 | 2176 | 96.93 | 2.67 | 1.81 | .155 |
| | 17077950 | 232614 | 303227 | 31743 | 81.73 | 1.11 | 1.45 | .152 |
| 72 1 | 1169935 | 24591 | 21108 | 1174 | 87.66 | 1.84 | 1.58 | .088 |
| 72 2 | 3087218 | 22061 | 24659 | 1248 | 171.41 | 1.22 | 1.37 | .069 |
| 72 3 | 715451 | 28556 | 19104 | 1053 | 56.67 | 2.26 | 1.51 | .083 |
| 72 4 | 1842649 | 22149 | 39196 | 1927 | 60.15 | .72 | 1.28 | .063 |
| ■2 4 | 1842649 | 22149 | 39196 | 1927 | 60.15 | .72 | 1.28 | .063 |
| 72 5 | 2418680 | 27424 | 67667 | 3116 | 42.60 | .48 | 1.19 | .055 |
| 72 6 | 4724439 | 44188 | 109478 | 4605 | 49.73 | .47 | 1.15 | .048 |
| 72 7 | 1968522 | 37644 | 185973 | 5266 | 22.17 | .42 | 2.09 | .059 |
| 72 8 | 707135 | 18875 | 132276 | 15877 | 11.60 | .31 | 2.17 | .260 |
| 72 9 | 1353892 | 17779 | 51552 | 6970 | 32.41 | .43 | 1.23 | .167 |
| 72 10 | 747207 | 30957 | 55753 | 8931 | 21.42 | .89 | 1.60 | .256 |
| 72 11 | 1438473 | 30465 | 39789 | 2787 | 32.83 | .70 | .91 | .064 |
| 72 12 | 523124 | 17136 | 33094 | 4316 | 21.11 | .69 | 1.34 | .174 |
| | 20696725 | 321825 | 779648 | 57268 | 39.69 | .62 | 1.50 | .110 |
| 73 1 | 910799 | 22294 | 23277 | 1279 | 55.89 | 1.37 | 1.43 | .079 |
| 73 2 | 1329880 | 25462 | 13477 | 888 | 136.08 | 2.61 | 1.38 | .091 |
| 73 3 | 442784 | 20101 | 15265 | 917 | 39.27 | 1.78 | 1.35 | .081 |
| 73 4 | 73336 | 5819 | 1870 | 180 | 113.38 | 9.00 | 2.89 | .279 |
| 73 5 | 450318 | 6653 | 3031 | 221 | 226.36 | 3.34 | 1.52 | .111 |
| 73 6 | 2117509 | 31599 | 25693 | 1331 | 72.86 | 1.09 | .88 | .046 |
| ■3 6 | 2117509 | 31599 | 25693 | 1331 | 72.86 | 1.09 | .88 | .046 |
| 73 7 | 1644762 | 29005 | 222566 | 5970 | 16.42 | .29 | 2.22 | .060 |
| 73 8 | 3345718 | 50502 | 154089 | 16167 | 26.97 | .41 | 1.24 | .130 |
| 73 9 | 563782 | 12332 | 135934 | 19774 | 4.75 | .10 | 1.15 | .167 |
| 73 10 | 1466583 | 20128 | 74172 | 14153 | 31.04 | .43 | 1.57 | .300 |
| 73 11 | 686050 | 16630 | 74581 | 6208 | 11.00 | .27 | 1.20 | .100 |
| 73 12 | 281395 | 22314 | 20970 | 2329 | 16.51 | 1.31 | 1.23 | .137 |
| | 13312915 | 262840 | 764925 | 69417 | 24.72 | .49 | 1.42 | .129 |
| 74 1 | 931399 | 29802 | 68957 | 2979 | 10.33 | .33 | .77 | .033 |
| 74 2 | 0 | 0 | 11222 | 468 | 0.00 | 0.00 | 1.20 | .050 |
| 74 3 | 143521 | 8775 | 3487 | 283 | 91.21 | 5.58 | 2.22 | .180 |
| 74 4 | 282917 | 16245 | 5409 | 506 | 207.37 | 11.91 | 3.96 | .371 |
| 74 5 | 535057 | 10696 | 5181 | 360 | 228.13 | 4.56 | 2.21 | .154 |
| 74 6 | 2845668 | 29144 | 42505 | 1942 | 90.53 | .93 | 1.35 | .062 |
| 74 7 | 3825414 | 43303 | 139518 | 4263 | 61.72 | .70 | 2.25 | .069 |
| 74 8 | 1652502 | 23124 | 151602 | 17717 | 23.32 | .33 | 2.14 | .250 |
| ■4 8 | 1652502 | 23124 | 151602 | 17717 | 23.32 | .33 | 2.14 | .250 |
| 74 9 | 3209147 | 41645 | 42230 | 3740 | 106.35 | 1.38 | 1.40 | .124 |
| 74 10 | 555490 | 40722 | 168821 | 29005 | 4.81 | .35 | 1.46 | .251 |
| 74 11 | 670430 | 42862 | 26064 | 1535 | 21.49 | 1.37 | .84 | .043 |
| 74 12 | 21639 | 5581 | 24662 | 3404 | 1.18 | .30 | 1.35 | .186 |
| | 14673185 | 291900 | 689658 | 66200 | 31.61 | .63 | 1.43 | .143 |

EXHIBIT 7-13: CLADM Quality Output for Western C-14 Using Planned Scenario.

## PLAN SCENARIO LAND USES
### HILLSBORO + C14

| | TLSS | TLBOD | TLN | TLP | TCSS | TCBOD | TCN | TCP |
|---|---|---|---|---|---|---|---|---|
| 63 1 | 0 | 102814 | 19244 | 2519 | 0.00 | 7.02 | 1.31 | .172 |
| 63 2 | 53664 | 67530 | 32522 | 2495 | 1.08 | 1.36 | .66 | .050 |
| 63 2 | 53664 | 67530 | 32522 | 2495 | 1.08 | 1.36 | .66 | .050 |
| 63 3 | 72208 | 74252 | 11150 | 1716 | 3.05 | 3.14 | .47 | .072 |
| 63 4 | 4483 | 10987 | 1261 | 238 | 2.41 | 5.91 | .68 | .128 |
| 63 5 | 302959 | 76079 | 9627 | 1669 | 7.05 | 1.77 | .22 | .039 |
| 63 6 | 137698 | 60607 | 20071 | 1812 | 3.54 | 1.56 | .52 | .047 |
| 63 7 | 9139 | 55226 | 49564 | 2242 | .45 | 2.73 | 2.45 | .111 |
| 63 8 | 131301 | 66731 | 18325 | 2715 | 4.82 | 2.45 | .67 | .100 |
| 63 9 | 399893 | 70222 | 33376 | 5115 | 5.27 | .93 | .44 | .067 |
| 63 10 | 129778 | 38445 | 100219 | 20712 | 1.65 | .49 | 1.28 | .264 |
| 63 11 | 25372 | 49002 | 24109 | 2602 | 1.02 | 1.97 | .97 | .105 |
| 63 12 | 65525 | 113528 | 14518 | 2664 | 3.50 | 6.06 | .78 | .142 |
| | 1332020 | 785423 | 333986 | 46499 | 3.19 | 1.88 | .80 | .111 |
| 64 1 | 44392 | 37882 | 69831 | 3354 | .73 | .62 | 1.15 | .055 |
| 64 2 | 130528 | 72028 | 45076 | 3090 | 2.73 | 1.51 | .94 | .065 |
| 64 3 | 227929 | 58662 | 14984 | 1603 | 10.66 | 2.74 | .70 | .075 |
| 64 4 | 368737 | 90098 | 13654 | 2069 | 17.04 | 4.16 | .63 | .096 |
| 64 4 | 368737 | 90098 | 13654 | 2069 | 17.04 | 4.16 | .63 | .096 |
| 64 5 | 361224 | 53316 | 34618 | 2320 | 7.19 | 1.06 | .69 | .046 |
| 64 6 | 407763 | 65614 | 61075 | 3460 | 5.48 | .88 | .82 | .047 |
| 64 7 | 243967 | 53598 | 21955 | 1542 | 9.53 | 2.09 | .86 | .060 |
| 64 8 | 473639 | 81604 | 78217 | 10031 | 7.14 | 1.23 | 1.18 | .151 |
| 64 9 | 221710 | 59147 | 41126 | 6280 | 4.15 | 1.11 | .77 | .118 |
| 64 10 | 451966 | 72931 | 169834 | 34940 | 3.48 | .56 | 1.31 | .269 |
| 64 11 | 378 | 20744 | 57659 | 5058 | .01 | .44 | 1.22 | .107 |
| 64 12 | 37401 | 98353 | 53795 | 8111 | .90 | 2.38 | 1.30 | .196 |
| | 2969634 | 763977 | 661825 | 81859 | 4.64 | 1.19 | 1.03 | .128 |
| 65 1 | 6025 | 20736 | 3200 | 482 | 2.26 | 7.78 | 1.20 | .181 |
| 65 2 | 170885 | 110539 | 26394 | 2959 | 4.88 | 3.15 | .75 | .084 |
| 65 3 | 7770 | 36160 | 12278 | 1123 | .79 | 3.66 | 1.24 | .114 |
| 65 4 | 6537 | 32612 | 3719 | 706 | 4.67 | 23.30 | 2.66 | .505 |
| 65 5 | 5647 | 10406 | 1198 | 226 | 6.79 | 12.51 | 1.44 | .271 |
| 65 6 | 635946 | 89549 | 18737 | 2235 | 11.62 | 1.64 | .34 | .041 |
| 65 6 | 635946 | 89549 | 18737 | 2235 | 11.62 | 1.64 | .34 | .041 |
| 65 7 | 326836 | 80028 | 139720 | 4881 | 3.45 | .85 | 1.48 | .052 |
| 65 8 | 41546 | 61190 | 105436 | 13339 | .75 | 1.10 | 1.89 | .240 |
| 65 9 | 61252 | 49040 | 43867 | 6702 | 1.29 | 1.03 | .92 | .141 |
| 65 10 | 269936 | 81184 | 226021 | 46735 | 1.07 | .32 | .89 | .185 |
| 65 11 | 67148 | 42415 | 118663 | 10392 | .60 | .38 | 1.06 | .093 |
| 65 12 | 21407 | 60732 | 28025 | 4279 | 1.09 | 3.08 | 1.42 | .217 |
| | 1620935 | 674590 | 727258 | 94060 | 2.36 | .98 | 1.06 | .137 |
| 66 1 | 97340 | 85137 | 66736 | 4047 | 1.67 | 1.46 | 1.14 | .069 |
| 66 2 | 300335 | 53901 | 55711 | 3214 | 4.34 | .78 | .81 | .046 |
| 66 3 | 78860 | 44968 | 31544 | 2071 | 2.76 | 1.59 | 1.11 | .073 |
| 66 4 | 50780 | 74474 | 9534 | 1654 | 7.32 | 10.73 | 1.37 | .238 |
| 66 5 | 260711 | 86001 | 21618 | 2340 | 9.36 | 3.09 | .78 | .084 |
| 66 6 | 752694 | 62149 | 158236 | 7120 | 3.63 | .30 | .76 | .034 |
| 66 7 | 59420 | 55664 | 480573 | 12648 | .33 | .31 | 2.67 | .070 |
| 66 8 | 218356 | 55698 | 77102 | 9779 | 4.04 | 1.03 | 1.43 | .181 |
| 66 8 | 218356 | 55698 | 77102 | 9779 | 4.04 | 1.03 | 1.43 | .181 |
| 66 9 | 432822 | 66717 | 49983 | 7538 | 6.23 | .96 | .72 | .109 |
| 66 10 | 375442 | 58424 | 263419 | 54501 | 2.42 | .38 | 1.70 | .352 |
| 66 11 | 10541 | 45140 | 37583 | 3681 | .36 | 1.54 | 1.28 | .125 |
| 66 12 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2640002 | 747494 | 1267875 | 111157 | 2.95 | 83 | 1.42 | .124 |
| 67 1 | 70636 | 85872 | 31902 | 2713 | 2.75 | 3.34 | 1.24 | .106 |
| 67 2 | 115909 | 67713 | 24220 | 2148 | 5.06 | 2.96 | 1.06 | .094 |
| 67 3 | 258794 | 75934 | 14207 | 1859 | 13.48 | 3.95 | .74 | .097 |
| 67 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 67 5 | 8202 | 5410 | 640 | 118 | 22.52 | 14.85 | 1.76 | .323 |
| 67 6 | 1022356 | 79404 | 172100 | 7938 | 5.86 | .46 | .99 | .046 |
| 67 7 | 123879 | 51796 | 189301 | 5545 | 1.63 | .68 | 2.49 | .073 |
| 67 8 | 306365 | 81806 | 111087 | 14103 | 4.29 | 1.14 | 1.55 | .197 |
| 67 9 | 348497 | 59640 | 41595 | 6300 | 6.11 | 1.05 | .73 | .110 |
| 67 10 | 261154 | 44351 | 239723 | 49666 | 1.93 | .33 | 1.77 | .367 |
| 67 10 | 261154 | 44351 | 239723 | 49666 | 1.93 | .33 | 1.77 | .367 |
| 67 11 | 170710 | 46181 | 15721 | 1839 | 6.94 | 1.88 | .64 | .075 |
| 67 12 | 36292 | 83953 | 23359 | 3748 | 2.15 | 4.97 | 1.38 | .222 |
| | 2722794 | 682060 | 863857 | 95976 | 4.36 | 1.09 | 1.38 | .154 |
| 68 1 | 35107 | 40313 | 7067 | 968 | 5.44 | 6.24 | 1.09 | .150 |
| 68 2 | 69403 | 89340 | 15469 | 2153 | 4.94 | 6.35 | 1.10 | .153 |
| 68 3 | 38135 | 40100 | 4673 | 871 | 6.22 | 6.54 | .76 | .142 |
| 68 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 68 5 | 404047 | 87855 | 122544 | 6567 | 2.76 | .60 | .84 | .045 |
| 68 6 | 288560 | 34180 | 194521 | 8057 | 1.32 | .16 | .89 | .037 |
| 68 7 | 54205 | 16838 | 299891 | 7553 | .40 | .13 | 2.23 | .056 |
| 68 8 | 70156 | 105011 | 92680 | 12114 | 1.11 | 1.66 | 1.47 | .192 |
| 68 9 | 392869 | 68221 | 72026 | 10825 | 3.51 | .61 | .64 | .097 |
| 68 10 | 128104 | 35058 | 351877 | 73119 | .66 | .18 | 1.80 | .374 |
| 68 11 | 15411 | 44945 | 30891 | 3120 | .57 | 1.65 | 1.13 | .114 |
| 68 12 | 18807 | 55755 | 6491 | 1223 | 9.03 | 26.78 | 3.12 | .587 |
| | 1514804 | 617616 | 1198131 | 126570 | 1.64 | .67 | 1.29 | .137 |
| | 1514804 | 617616 | 1198131 | 126570 | 1.64 | .67 | 1.29 | .137 |
| 69 1 | 319966 | 100520 | 33527 | 3015 | 8.29 | 2.60 | .87 | .078 |
| 69 2 | 172582 | 57562 | 18316 | 1726 | 9.85 | 3.29 | 1.05 | .099 |
| 69 3 | 413573 | 90202 | 52086 | 3670 | 6.91 | 1.51 | .87 | .061 |
| 69 4 | 14021 | 39437 | 29969 | 1915 | .58 | 1.64 | 1.24 | .079 |
| 69 5 | 174376 | 83227 | 75548 | 4545 | 2.63 | 1.26 | 1.14 | .069 |
| 69 6 | 930472 | 63854 | 107805 | 5199 | 6.81 | .47 | .79 | .038 |
| 69 7 | 210245 | 80718 | 147822 | 5091 | 2.60 | 1.00 | 1.83 | .063 |
| 69 8 | 132901 | 64138 | 209820 | 26081 | 1.24 | .60 | 1.96 | .243 |
| 69 9 | 408428 | 65487 | 68290 | 10254 | 4.55 | .73 | .76 | .114 |
| 69 10 | 104939 | 52378 | 190317 | 39459 | 1.05 | .52 | 1.90 | .394 |
| 69 11 | 53577 | 31018 | 147509 | 12659 | .43 | .25 | 1.17 | .101 |
| 69 12 | 25947 | 42009 | 109671 | 15652 | .31 | .50 | 1.31 | .187 |
| | 2961027 | 770550 | 1190679 | 129267 | 3.18 | .83 | 1.28 | .139 |
| 70 1 | 341892 | 108630 | 59660 | 4165 | 6.17 | 1.96 | 1.08 | .075 |
| 70 2 | 313286 | 62998 | 45618 | 2945 | 6.67 | 1.34 | .97 | .063 |
| 70 2 | 313286 | 62998 | 45618 | 2945 | 6.67 | 1.34 | .97 | .063 |
| 70 3 | 714829 | 84093 | 134070 | 6963 | 4.84 | .57 | .91 | .047 |
| 70 4 | 0 | 0 | 36185 | 1508 | 0.00 | 0.00 | 1.20 | .050 |
| 70 5 | 498686 | 36709 | 51529 | 4429 | 10.49 | .77 | 1.08 | .093 |
| 70 6 | 825803 | 72997 | 87918 | 4599 | 7.24 | .64 | .77 | .040 |
| 70 7 | 288058 | 27651 | 225481 | 5961 | 2.72 | .26 | 2.13 | .056 |
| 70 8 | 128160 | 51865 | 39466 | 5183 | 3.55 | 1.44 | 1.09 | .144 |
| 70 9 | 87431 | 99158 | 51712 | 8097 | 1.64 | 1.86 | .97 | .152 |
| 70 10 | 41665 | 32283 | 134356 | 27886 | .60 | .47 | 1.95 | .405 |
| 70 11 | 0 | 10727 | 1216 | 232 | 0.00 | 17.01 | 1.93 | .368 |
| 70 12 | 0 | 28594 | 3242 | 619 | 0.00 | 37.18 | 4.22 | .805 |
| | 3239810 | 615705 | 870452 | 72587 | 4.58 | .87 | 1.23 | .103 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 71 1 | 20[illegible] | 69436 | 7930 | 1504 | 6.03 | 20.81 | 2.30 | .451 |
| 71 2 | 25[illegible] | 64139 | 7602 | 1401 | 5.00 | 12.56 | 1.49 | .274 |
| 71 3 | 0 | 5879 | 667 | 127 | 0.00 | 26.38 | 2.99 | .571 |
| 71 4 | 0 | 0 | 0 | 0 | I | I | I | I |
| 71 5 | 442474 | 99277 | 16445 | 2335 | 17.27 | 3.88 | .64 | .091 |
| ■1 5 | 442474 | 99277 | 16445 | 2335 | 17.27 | 3.88 | .64 | .091 |
| 71 6 | 243955 | 81183 | 14060 | 1932 | 11.57 | 3.85 | .67 | .092 |
| 71 7 | 82072 | 42343 | 5072 | 923 | 13.07 | 6.74 | .81 | .147 |
| 71 8 | 102752 | 75673 | 17139 | 2623 | 10.78 | 4.46 | 1.01 | .155 |
| 71 9 | 459655 | 36676 | 39320 | 5804 | 8.16 | .65 | .70 | .103 |
| 71 10 | 295067 | 100043 | 82647 | 16831 | 5.14 | 1.74 | 1.44 | .293 |
| 71 11 | 151211 | 13901 | 57998 | 4973 | 2.53 | .23 | .97 | .083 |
| 71 12 | 181869 | 100921 | 20817 | 3431 | 10.25 | 5.69 | 1.17 | .193 |
| | 2084734 | 689471 | 269706 | 41884 | 7.73 | 2.56 | 1.00 | .155 |
| 72 1 | 116683 | 68206 | 18283 | 1878 | 7.13 | 4.17 | 1.12 | .115 |
| 72 2 | 178115 | 46529 | 20356 | 1625 | 7.63 | 1.99 | .87 | .070 |
| 72 3 | 577686 | 93387 | 12497 | 2063 | 24.27 | 3.92 | .52 | .087 |
| 72 4 | 134360 | 58473 | 35953 | 2478 | 3.99 | 1.74 | 1.07 | .074 |
| 72 5 | 241145 | 63804 | 63817 | 3721 | 3.68 | .97 | .97 | .057 |
| 72 6 | 674607 | 65005 | 96177 | 4788 | 6.01 | .58 | .86 | .043 |
| 72 7 | 396459 | 72848 | 184573 | 5828 | 3.83 | .72 | 1.83 | .058 |
| ■2 7 | 396459 | 72848 | 184573 | 5828 | 3.83 | .72 | 1.83 | .058 |
| 72 8 | 37383 | 59069 | 144401 | 18083 | .54 | .85 | 2.09 | .261 |
| 72 9 | 78234 | 51534 | 49240 | 7502 | 1.80 | 1.19 | 1.13 | .173 |
| 72 10 | 242217 | 67460 | 51227 | 10394 | 5.93 | 1.65 | 1.26 | .254 |
| 72 11 | 272176 | 70183 | 34853 | 3705 | 5.15 | 1.33 | .66 | .070 |
| 72 12 | 24036 | 57286 | 35738 | 5342 | .86 | 2.04 | 1.27 | .190 |
| | 2363101 | 773784 | 747115 | 67397 | 4.86 | 1.27 | 1.22 | .110 |
| 73 1 | 48252 | 71625 | 22535 | 2106 | 2.76 | 4.10 | 1.29 | .120 |
| 73 2 | 121977 | 76977 | 15692 | 1948 | 6.99 | 4.41 | .90 | .112 |
| 73 3 | 69132 | 58817 | 15269 | 1626 | 4.56 | 3.88 | 1.01 | .107 |
| 73 4 | 4183 | 30842 | 3511 | 667 | 1.91 | 14.06 | 1.60 | .304 |
| 73 5 | 50306 | 58468 | 6796 | 1270 | 7.43 | 8.63 | 1.00 | .188 |
| 73 6 | 208906 | 60227 | 22015 | 1876 | 4.91 | 1.42 | .52 | .044 |
| 73 7 | 251536 | 53129 | 212618 | 6133 | 2.34 | .49 | 1.98 | .057 |
| 73 8 | 652462 | 81476 | 167222 | 20844 | 4.25 | .53 | 1.09 | .136 |
| 73 9 | 30002 | 37715 | 152815 | 22777 | .22 | .27 | 1.11 | .166 |
| ■3 9 | 30002 | 37715 | 152815 | 22777 | .22 | .27 | 1.11 | .166 |
| 73 10 | 80993 | 55254 | 78752 | 16237 | 1.46 | 1.00 | 1.42 | .293 |
| 73 11 | 34184 | 57531 | 83476 | 7651 | .47 | .80 | 1.16 | .106 |
| 73 12 | 66747 | 72904 | 22248 | 3517 | 3.19 | 3.49 | 1.06 | .168 |
| | 1618680 | 714965 | 802948 | 86652 | 2.50 | 1.10 | 1.24 | .134 |
| 74 1 | 267058 | 53800 | 66727 | 3497 | 2.51 | .51 | .63 | .033 |
| 74 2 | 0 | 0 | 11705 | 488 | 0.00 | 0.00 | 1.20 | .050 |
| 74 3 | 69152 | 10496 | 7556 | 1404 | 16.75 | 2.54 | 1.83 | .340 |
| 74 4 | 4695 | 19860 | 2267 | 430 | 5.30 | 22.42 | 2.56 | .485 |
| 74 5 | 114059 | 69772 | 8288 | 1519 | 17.81 | 10.89 | 1.29 | .237 |
| 74 6 | 365051 | 56147 | 34805 | 2293 | 9.21 | 1.42 | .88 | .058 |
| 74 7 | 522145 | 80610 | 137516 | 4838 | 7.05 | 1.09 | 1.86 | .065 |
| 74 8 | 205817 | 59972 | 154014 | 19208 | 2.66 | .78 | 1.99 | .248 |
| 74 9 | 512474 | 84597 | 30764 | 4750 | 13.53 | 2.23 | .81 | .125 |
| 74 10 | 898670 | 24098 | 148250 | 30268 | 7.01 | .19 | 1.16 | .236 |
| 74 11 | 339523 | 96660 | 24690 | 3168 | 7.06 | 2.01 | .51 | .066 |
| ■4 11 | 339523 | 96660 | 24690 | 3168 | 7.06 | 2.01 | .51 | .066 |
| 74 12 | 0 | 16297 | 27267 | 3927 | 0.00 | .78 | 1.31 | .189 |
| | 3298643 | 572309 | 653849 | 75791 | 5.96 | 1.03 | 1.18 | .137 |

Exhibit 7.14: Computer Program for the Discharge Model

```
MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWM
WMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW
MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWM
WMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW


                   PROGRAM DISCHAR(LAND,TAPE1=LAND,SCENAR,
                *  TAPE2=SCENAR,CARDS,TAPE3=CARDS,OUTPUT
                *  ,DISCHAR,TAPE4=DISCHAR)
000003             DIMENSION DISH(12),SWETH(12),SWETF(12)

            *READ ITITLE FROM LAND SCENARIO FILE AND SKIP TO
            *READ ITITLE FROM LAND SCENARIO FILE AND SKIP TO
            *DATA

000003            DISFNS=0.
000004             READ(1,1000) ITITLEL
000012             READ(2,1000) ITITLES
000020      1000   FORMAT(1X,A7/////////)

            *PRINT TITLE

000020            WRITE(4,1070)
000024      1070  FORMAT(26X,*73-74 LAND USES*,33X,1H*,15X,
                * *SCENARIO LAND USES*)
000024            WRITE(4,1060)
000030      1060  FORMAT(9X,*RAINFALL*,2X,*DISCHARGE*,5X,*RUNOFF*,7X,
                * *SWET*,7X,*DSET*,7X,*NGWL*,7X,*NGWL*,5X,*RUNOFF*,
                * 7X,*DSET*,7X,*SWET*,2X,*DISCHARGE*)
            *READ SURFACE WATER DATA HISTORICAL AND FUTURE

000030             READ(3,1004)ISWHT,IDUM,(SWETH(I),I=1,12)
000046             READ(3,1004) ISWFT,IDUM,(SWETF(I),I=1,12)

            *READ IFI CONSTANT
            *CHECK TITLE ON ALL INPUT DATA. WILL INSURE ALL
            *DATA IS FOR THE SAME STRUCTURE.

000064            IF(ITITLEL.EQ.ITITLES.AND.ITITLES.EQ.ISWHT.AND.
                * ISWHT.EQ.ISWFT)05,9010
000101      05    CONTINUE

000101             READ(3,1020) XIFI
000107      1020   FORMAT(F6.3)
000107      10     CONTINUE

            *READ DISCHARGE DATA

000107             READ(3,1004) IDISHT,IYRDISH,(DISH(I),I=1,12)
000125      1004   FORMAT(A7,X,I2,7(F10.2)/10X,5(F10.2))
000125             IF(EOF,3) 9999,20
000130      20     CONTINUE

            *CHECK TITLE ON ALL INPUT DATA. WILL INSURE ALL
            *DATA FROM SAME STRUCTURE.

000130            IF(IDISHT.NE.ITITLEL)GO TO 9010

            *DO CALCULATIONS FOR EVERY 12 MONTHS OF YEAR
```

```
000132          DO 60 I=1,12

          *READ HISTORICAL DATA


000134          READ(1,1030)IYRH,IMOH,RAINH,RFH,DSETH
          *READ FUTURE DATA
‖         *READ FUTURE DATA
000151          READ(2,1030)IYRF,IMOF,RAINF,RFF,DSETF
000167    1030  FORMAT(1X,I2,X,I2,80X,3(2X,F9.0))
000167          IF(IYRH.EQ.IYRF.AND.IMOH.EQ.IMOF)25,9020
000200    25    CONTINUE
000200          IF(IYRH.NE.IYRDISH)GO TO 9030
000202          XNGWLH=RAINH-DISH(I)-DSETH-SWETH(I)
000206          IF(XNGWLH)30,30,40
000210    30    CONTINUE
000210          XNGWLF=XNGWLH*(1+XIFI)
000214          GO TO 50
000214    40    CONTINUE
000214          XNGWLF=XNGWLH/(1.+XIFI)
000217    50    CONTINUE
000217          DISF=RAINH-XNGWLF-DSETF-SWETF(I)+DISFNS
000224          IF(DISF)52,54,54
000226    52    CONTINUE
000226          DISFNS=DISF
000227          DISF=0.
000230          GO TO 56
000231    54    DISFNS=0.
000232    56    CONTINUE
000232          YRAINH=YRAINH+RAINH
000234          YDISH=YDISH+DISH(I)
000236          YRRFH=YRRFH+RFH
‖00236          YRRFH=YRRFH+RFH
000240          YRSWETH=YRSWETH+SWETH(I)
000242          YRDSETH=YRDSETH+DSETH
000244          YRXNGH=YRXNGH+XNGWLH
000246          YRXNGF=YRXNGF+XNGWLF
000250          YRRFF=YRRFF+RFF
000252          YRDSETF=YRDSETF+DSETF
000254          YRSWETF=YRSWETF+SWETF(I)
000256          YRDISF=YRDISF+DISF
000260          WRITE(4,2000)IYRH,IMOH,RAINH,DISH(I),RFH,SWETH(I),
               * DSETH,XNGWLH,XNGWLF,RFF,DSETF,SWETF(I),DISF
000315    2000  FORMAT(X,I2,X,I2,11(2X,F9.0))
000315    60    CONTINUE
000317          WRITE(4,2010)YRAINH,YDISH,YRRFH,YRSWETH,YRDSETH,YRXNGH,
               * YRXNGF,YRRFF,YRDSETF,YRSWETF,YRDISF
000351    2010  FORMAT(6X,11(2X,F9.0)/)
000351          YRAINH=YDISH=YRRFH=YRSWETH=YRDSETH=YRXNGH=YRXNGF=0.
000360          YRRFF=YRDSETF=YRSWETF=YRDISF=0.
000364          READ(1,1050)
000367          READ(2,1050)
000373    1050  FORMAT(X,/)
000373          GO TO 10
‖00373          GO TO 10

          *ERROR MESSAGES

000374    9010  CONTINUE
000374          WRITE(4,9011)
000400    9011  FORMAT(* STRUCTURE ID DO NOT MATCH*/
               * *CHECK ID ON ALL INPUT DATA*)
000400          STOP1
000402    9020  CONTINUE
000402          WRITE(4,9021)
000406    9021  FORMAT(* YEARS AND/OR MONTH  DO NOT MATCH ON INPUT DATA*
```

```
                   * * CHECK DATA FILES(LAND AND SCENARIO)*)
000406                STOP2
000410       9030     CONTINUE
000410                WRITE(4,9031)
000414       9031     FORMAT(* HISTORICAL DISCHARGE NOT IN SEQUENCE.*/
                   * * WITH INPUT FILES. CHECK YEAR SEQUENCE OF HISTORICAL*/
                   * * DISCHARGE.*)
000414                STOP3
000416       9999     STOP
000420                END
```

```
CROSS REFERENCE MAP-DISCHAR

PROGRAM LENGTH INCLUDING I/O BUFFERS
013052

STATEMENT FUNCTION REFERENCES

          LOCATION   GEN TAG    SYM TAG    REFERENCES
```


```
#         LOCATION   GEN TAG    SYM TAG    REFERENCES
```


```
STATEMENT NUMBER REFERENCES

          LOCATION   GEN TAG    SYM TAG    REFERENCES
          000101     L00037     5          000077
          000107     L00042     10         000373
          000130     L00051     20         NONE
          000200     L00070     25         000177
          000210     L00074     30         000207
          000214     L00076     40         000207
          000217     L00077     50         000213
          000226     L00101     52         NONE
          000231     L00104     54         000225
          000232     L00105     56         000230
          000441     C00017     1000       000004     000012
          000504     C00062     1004       000030     000046     000107
          000502     C00060     1020       000101
          000511     C00067     1030       000133     000151
          000525     C00103     1050       000363     000367
          000457     C00035     1060       000024
          000445     C00023     1070       000020
          000516     C00074     2000       000257
          000522     C00100     2010       000317
          000374     L00140     9010       000100     000131
          000527     C00105     9011       000374
          000402     L00145     9020       000177
```


```
#         000402     L00145     9020       000177
```


```
          000543     C00121     9021       000402
          000410     L00152     9030       000201
          000560     C00136     9031       000410
          000416     L00157     9999       000127

BLOCK NAMES AND LENGTHS

VARIABLE REFERENCES

          LOCATION   GEN TAG    SYM TAG    REFERENCES
          000704     V00032     DISF       000224     000226     000256     0003
          000656     V00004     DISFNS     000003     000222     000227     0002
          000612     A00001     DISH       NONE
          000701     V00027     DSETF      000164     000221     000252     0003
          000674     V00022     DSETH      000146     000204     000242     0002
          000663     V00011     I          000040     000043     000056     000
                                           000133     000202     000217     0002
```

EXHIBIT 7.12: CLADM Quality Output for Western C-14 Using 1973-74 Land Uses

```
                                          000274    000310    000315
        000666   V00014   IDISHT    000112    000130
        000662   V00010   IDUM      000035    000053
        000676   V00024   IMOF      000156    000173
        000671   V00017   IMOH      000140    000172    000264

        000664   V00012   ISWFT     000051    000073
  ‖     000664   V00012   ISWFT     000051    000073
        000661   V00007   ISWHT     000033    000070
        000657   V00005   ITITLEL   000007    000064    000130
        000660   V00006   ITITLES   000015    000064
        000667   V00015   IYRDISH   000114    000200
        000675   V00023   IYRF      000154    000167
        000670   V00016   IYRH      000136    000167    000200    00026
        000677   V00025   RAINF     000160
        000672   V00020   RAINH     000142    000203    000220    00023
        000700   V00026   RFF       000162    000250    000304
        000673   V00021   RFH       000144    000236    000272
        000642   A00003   SWETF     NONE
        000626   A00002   SWETH     NONE
        000665   V00013   XIFI      000104    000211    000214
        000703   V00031   XNGWLF    000213    000216    000220    00024
        000702   V00030   XNGWLH    000206    000212    000215    00024
        000706   V00034   YDISH     000235    000324    000356
        000705   V00033   YRAINH    000232    000322    000357
  ‖     000705   V00033   YRAINH    000232    000322    000357
        000717   V00045   YRDISF    000255    000346    000360
        000715   V00043   YRDSETF   000251    000342    000362
        000711   V00037   YRDSETH   000241    000332    000353
        000714   V00042   YRRFF     000247    000340    000363
        000707   V00035   YRRFH     000236    000326    000355
        000716   V00044   YRSWETF   000254    000344    000361
        000710   V00036   YRSWETH   000240    000330    000354
        000713   V00041   YRXNGF    000245    000336    000351
        000712   V00040   YRXNGH    000243    000334    000352

START OF CONSTANTS
000422

START OF TEMPORARIES
000602

START OF INDIRECTS
000607

UNUSED COMPILER SPACE
011200


                  SUBROUTINE CHANGE(ARRAY)
000003            DIMENSION ARRAY(12)
000003            DO 10 I=1,12
000005            ARRAY(I)=(ARRAY(I)*(74850.))/12.
000010     10     CONTINUE
000012            RETURN
000012            END


CROSS REFERENCE MAP-CHANGE
‖ROSS REFERENCE MAP-CHANGE

SUBPROGRAM LENGTH
000025

STATEMENT FUNCTION REFERENCES
```

```
          LOCATION  GEN TAG   SYM TAG   REFERENCES
STATEMENT NUMBER REFERENCES
          LOCATION  GEN TAG   SYM TAG   REFERENCES
BLOCK NAMES AND LENGTHS
VARIABLE REFERENCES
          LOCATION  GEN TAG   SYM TAG   REFERENCES
          000024    V00002    I         000004
START OF CONSTANTS
000014
START OF TEMPORARIES
000017
START OF INDIRECTS
000023
UNUSED COMPILER SPACE
013400
#13400
AJYQJLH.  17.46.42. 77/02/16.



************************************
************************************
 THIS IS   D I S P O S E D   OUTPUT.
 IT  WILL  NOT  HAVE  A  CARD  DECK.
 PLEASE PUT OUT FOR USER     9364003
************************************
************************************


#
```

Exhibit 7.15: Computer Program for the Quality Computations

RPMQUA T=00004 IS ON CR00002 USING 00023 BLKS R=0197

```
RPM,T10,CM50000. MCGRAW-FOY
ACCOUNT,
CBR,,QUALITY.
R,QUALITY.
RUN,S,,,QUALITY,LOOK,QUALITB.
RP,QUALITY,QUALITB.
DISPOSE,LOOK=PR/EI=9364003.
$D
      PROGRAM QUALITY(SCENAR,TAPE1=SCENAR,SCENARU,TAPE3=SCENARU,
     * LAND,TAPE2=LAND,
     * DISCHAR,TAPE4=DISCHAR,CARD2,TAPE5=CARD2,ONPS,TAPE10=ONPS
     * ,TLTC,TAPE11=TLTC,RLSSRLU,TAPE13=RLSSRLU,OUTPUT)
      DIMENSION ONPSCS(12),ONPSCB(12),ONPSCN(12),ONPSCP(12)

*READ INPUT CARDS

      CALL READIT(ONPSCS)
      CALL READIT(ONPSCB)
      CALL READIT(ONPSCN)
      CALL READIT(ONPSCP)

      READ(5,8001)REFFSS,REFBOD,REFFN,REFFP
8001  FORMAT(10X,4(F10.2))

*SKIP HEADER ON INPUT FILES

      CALL SKHEAD

*PRINT HEADER ON OUTPUT FILES

      CALL HEADER
10    CONTINUE

      DO 20 I=1,12

*READ FUTURE DISCHARGE FROM FILE

       READ(4,8000)IDATE1,DISF
8000   FORMAT(X,R5,10(11X),2X,F9.0)

      IF(EOF,4)9999,25
25    CONTINUE

*READ SUMMARY DATA NONURBAN

      READ(1,8010)IDATE2,RLSS,RLBOD,RLN,RLP,SRQN
8010  FORMAT(X,R5,3X,2(11X),4(2X,F9.0),2(11X),2X,F9.0)

*READ DATA LAND

      READ(2,8010)IDATE4,RLLSS,RLLBOD,RLLN,RLLP,SRLQN

*READ SUMMARY DATA URBAN
      READ(3,8010)IDATE3,RLUSS,RLUBOD,RLUN,RLUP,SRUQN
*CHECK MONTH AND YEAR ON THE THREE INPUT FILES
      IF(IDATE1.NE.IDATE2.OR.IDATE2.NE.IDATE3
     * .OR.IDATE3.NE.IDATE4) GO TO 9000

*START CALCULATIONS'FOR EACH MONTH

```

```
      STOP
      END
      SUBROUTINE HEADER
      WRITE(10,8000)
8000  FORMAT(12X,*ONPSLS*,6X,*ONPSLB*,6X,*ONPSLN*,6X,*ONPSLP*,
     * 5X,*ONPSCSY*,5X,*ONPSCBY*,5X,*ONPSCNY*,5X,*ONPSCPY*
     * ,6X,*ONPSQN*)
      WRITE(11,8010)
8010  FORMAT(14X,*TLSS*,7X,*TLBOD*,9X,*TLN*,9X,*TLP*,8X,
     * *TCSS*,7X,*TCBOD*,9X,*TCN*,9X,*TCP*)
      WRITE(13,8030)
8030  FORMAT(12X,*RLSS/SR*,2X,*RLBOD/SR*,4X,*RLN/SR*,4X,*RLP/S
     * 2X,*RLUSS/SR*,1X,*RLUBOD/SR*,3X,*RLUN/SR*,3X,*RLUP/SR*
     * ,2X,*RLLSS/SR*,1X,*RLLBOD/SR*,3X,*RLLN*,3X,*RLLP*)
      RETURN
      END
      SUBROUTINE READIT(ARRAY)
      DIMENSION ARRAY(12)
      READ(5,8000) ARRAY
8000  FORMAT(10X,7(F10.3)/10X,5(F10.3))
      RETURN
      END
      SUBROUTINE SKIPIT
      READ(4,8010)IDUM
      READ(2,8010) IDUM
      READ(1,8010)IDUM
      READ(3,8010)IDUM
8010  FORMAT(A10)
      RETURN
      END
      SUBROUTINE SKHEAD
      READ(1,8000)
      READ(2,8000)
      READ(3,8000)
8000  FORMAT(////////)
      READ(4,8010)
8010  FORMAT(/)
      RETURN
      END
$E
```

```
      ONPSCBY=SUMSLB/YYYSQN
      ONPSCNY=SUMSLN/YYYSQN
      ONPSCPY=SUMSLP/YYYSQN

      WRITE(10,8040)IDATE1,SUMSLS,SUMSLB,SUMSLN,SUMSLP,
     * ONPSCSY,ONPSCBY,ONPSCNY,ONPSCPY,SUMSQN
*READ YEARLY FUTURE DISCHARGE
      READ(4,8000)IDUM,DISCHYR

      ZZZDIS=DISCHYR*2.71778
      YRTCSS=SUMTLSS/ZZZDIS
      YRTCBOD=SUMTLBO/ZZZDIS
      YRTCN=SUMTLN/ZZZDIS
      YRTCP=SUMTLP/ZZZDIS

      WRITE(11,8040)IDATE1,SUMTLSS,SUMTLBO,SUMTLN,SUMTLP,
     * YRTCSS,YRTCBOD,YRTCN,YRTCP
      READ(1,8010)IDUM,RLSS,RLBOD,RLN,RLP,SRQN
      READ(3,8010)IDUM,RLUSS,RLUBOD,RLUN,RLUP,SRUQN
      READ(2,8010)IDUM,RLLSS,RLLBOD,RLLN,RLLP,SRLQN

      AAASRQN=SRQN*2.71778

      XRLSS=RLSS/AAASRQN
      XRLBOD=RLBOD/AAASRQN
      XRLN=RLN/AAASRQN
      XRLP=RLP/AAASRQN

      AAASRQN=SRUQN*2.71778

      XRLUSS=RLUSS/AAASRQN
      XRLUBOD=RLUBOD/AAASRQN
      XRLUN=RLUN/AAASRQN
      XRLUP=RLUP/AAASRQN

      AAASRQN=SRLQN*2.71778

      XRLLSS=RLLSS/AAASRQN
      XRLLBOD=RLLBOD/AAASRQN
      XRLLN=RLLN/AAASRQN
      XRLLP=RLLP/AAASRQN

      WRITE(13,8030)IDATE1,XRLSS,XRLBOD,XRLN,XRLP,
     * XRLUSS,XRLUBOD,XRLUN,XRLUP,XRLLS,XRLLBOD,XRLLN,XRLLP

      WRITE(10,8060)
      WRITE(11,8060)
      WRITE(13,8060)
8060  FORMAT(/)
*SKIP BETWEEN YEARLY DATA ON INPUT FILES

      CALL SKIPIT

*ZERO DATA

      SUMSQN=SUMSLS=SUMSLB=SUMSLN=SUMSLP=0.
      SUMTLSS=SUMTLBO=SUMTLN=SUMTLP=0.

      GO TO  10

*ERROR MESSAGES
9000  CONTINUE
      PRINT 9001
9001  FORMAT(* DATES ON INPUT FILES DO NOTT MATCH*)
      CALL ABORT
9999  CONTINUE
```

```
      ONPSQN=DISF-SRQN
      IF(ONPSQN.LT.0.) ONPSQN=0.0
      XXXSQN=ONPSQN*2.71778
      SUMSQN=SUMSQN+ONPSQN

      ONPSLS=ONPSCS(I)*XXXSQN
      SUMSLS=SUMSLS+ONPSLS
      ONPSLB=ONPSCB(I)*XXXSQN
      SUMSLB=SUMSLB+ONPSLB
      ONPSLN=ONPSCN(I)*XXXSQN
      SUMSLN=SUMSLN+ONPSLN
      ONPSLP=ONPSCP(I)*XXXSQN
      SUMSLP=SUMSLP+ONPSLP

      TLSS=ONPSLS+RLSS-REFFSS*RLUSS
      SUMTLSS=SUMTLSS+TLSS
      TLBOD=ONPSLB+RLBOD-REFBOD*RLUBOD
      SUMTLBO=SUMTLBO+TLBOD
      TLN=ONPSLN+RLN-REFFN*RLUN
      SUMTLN=SUMTLN+TLN
      TLP=ONPSLP+RLP-REFFP*RLUP
      SUMTLP=SUMTLP+TLP

      XXXCON=DISF*2.71778
      TCSS=TLSS/XXXCON
      TCBOD=TLBOD/XXXCON
      TCN=TLN/XXXCON
      TCP=TLP/XXXCON

      AAASRQN=SRQN*2.71778

      XRLSS=RLSS/AAASRQN
      XRLBOD=RLBOD/AAASRQN
      XRLN=RLN/AAASRQN
      XRLP=RLP/AAASRQN

      AAASRQN=SRUQN*2.71778

      XRLUSS=RLUSS/AAASRQN
      XRLUBOD=RLUBOD/AAASRQN
      XRLUN=RLUN/AAASRQN
      XRLUP=RLUP/AAASRQN

      AAASRQN=SRLQN*2.71778

      XRLLSS=RLLSS/AAASRQN
      XRLLBOD=RLLBOD/AAASRQN
      XRLLN=RLLN/AAASRQN
      XRLLP=RLLP/AAASRQN

      WRITE(10,8020)IDATE1,ONPSLS,ONPSLB,ONPSLN,ONPSLP
     * ,ONPSQN
 8020 FORMAT(X,R5,4(X,F11.0),48X,X,F11.0)
      WRITE(11,8040)IDATE1,TLSS,TLBOD,TLN,TLP,TCSS,TCBOD,TCN,T
 8040 FORMAT(X,R5,4(X,F11.0),3(X,F11.2),X,F11.3,X,F11.0)
 8030 FORMAT(X,R5,3(X,F9.2),X,F9.3,3(X,F9.2),X,F9.3
     * ,3(X,F9.2),X,F9.3)
      WRITE(13,8030)IDATE1,XRLSS,XRLBOD,XRLN,XRLP,XRLUSS,XRLUB
     * XRLUN,XRLUP,XRLLSS,XRLLBOD,XRLLN,XRLLP
 20   CONTINUE

*CALCULATE YEARLY DATA

      IDATE1=5R
      YYYSQN=SUMSQN*2.71778
      ONPSCSY=SUMSLS/YYYSQN
```

Exhibit 7.16: Computer Program for the Summary Output

```
MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW
WMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWM
MWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMW
WMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWMWM
```

```
                      PROGRAM SUMM(OUTPUT,QUAL,TAPE1=QUAL,OUT,TAPE4=OUT
                     *,QUALSUM,TAPE2=QUALSUM)
 000003               COMMON/TOT/ TRF,ITSUSP,ITBOD,ITN,ITPO4
 ‖00003               COMMON/TOT/ TRF,ITSUSP,ITBOD,ITN,ITPO4
 000003               COMMON/CONSTA/AREA,RFCOEFF,AREAN,CN,CONST
 000003               COMMON/ARRY/ TRAIN(25,12),YRRAIN(25)
 000003               DATA AREA,RFCOEFF,AREAN,CN,CONST/5*0./
 000003               DATA(TRAIN(I),I=1,300 )/300*0./
 000003               DATA(YRRAIN( I),I=1,25)/25*0./
 000003               DIMENSION IHOLD(132)
 000003               DATA IOLDMO/0/
 000003               DATA TRF,ITSUSP,ITBOD,ITN,ITPO4/1*0.,4*0/
 000003               CALL GETCOEF
 000004     10        CONTINUE
 000004               CALL BLANKIT(IHOLD)
 000006               READ(1,1000) IHOLD
 000014     1000      FORMAT(132R1)
 000014               IF(EOF,1)9999,11
 000017     11        CONTINUE
 000017               IF(IHOLD(2).EQ.1R*.AND.IHOLD(3).EQ.1R*)GO TO 20
 000030     15        CONTINUE

 000030               GO TO 10
 000031     20        CONTINUE

 000031               CALL BLANKIT(IHOLD)
 000033               READ(1,1000) IHOLD
 000041               IF(EOF,1)9999,25
 ‖00041               IF(EOF,1)9999,25
 000044     25        CONTINUE
 000044               IF(IHOLD(2).EQ.1R .AND.IHOLD(6).EQ.1R1)30,20
 000055     30        CONTINUE
 000055               ENCODE(2,1030,IMO)(IHOLD(J),J=11,12)
 000071     1030      FORMAT(2R1)
 000071               DECODE(2,1040,IMO)MONTH
 000101     1040      FORMAT(I2)
 000101               ENCODE(5,2000,JYRMODY)(IHOLD(J),J=8,12)
 000115               DECODE(5,2010,JYRMODY)IYRMODY
 000125     2010      FORMAT(R5)
 000125     2000      FORMAT(5R1)
 000125               IF(IOLDMO.EQ.0) IOLDMO=MONTH
 000127               IF(MONTH.NE.IOLDMO
                    * )CALL PRINTIT(MONTH,IOLDMO
                    * ,IOLDYMD)
 000133               ENCODE(5,1060,IRUNOFF)(IHOLD(J),J=26,30)
 000147     1060      FORMAT(5R1)
 000147               DECODE(5,1062,IRUNOFF)RUNOFF
 000157     1062      FORMAT(F5.2)
 000157               TRF=TRF+RUNOFF
 000161               ENCODE(6,1064,ISUSP)(IHOLD(J),J=32,37)
 000175     1064      FORMAT(6R1)
 ‖00175     1064      FORMAT(6R1)
```

```
000175              DECODE(6,1066,ISUSP)INSUSP
000205    1066      FORMAT(I6)
000205              ITSUSP=ITSUSP+INSUSP
000207              ENCODE(5,1060,IBOD)(IHOLD(J),J=45,49)
000222              DECODE(5,1072,IBOD)INBOD
000232              ITBOD=ITBOD+INBOD
000234    1072       FORMAT(I5)
000234              ENCODE(5,1060,IN)(IHOLD(J),J=51,55)

000247              DECODE(5,1072,IN)N

000257              ITN=ITN+N
000261              ENCODE(5,1060,IP04)(IHOLD(J),J=56,60)
000274              DECODE(5,1072,IP04)NP04
000304              ITP04=ITP04+NP04

000306              CALL BLANKIT(IHOLD)
000307              IOLDYMD=IYRMODY
000311              READ(1,1000) IHOLD
000316              IF(EOF,1)9999,35
000321    35        CONTINUE
000321              IF(IHOLD(6).EQ.1R ) GO TO  38
000323              GO TO 30
000324    38        CONTINUE

000324              IF(IHOLD(2).EQ.1RP.AND.IHOLD(3).EQ.
                  * 1RA) 40,45
000335    40        CONTINUE
‖00335    40        CONTINUE

000335              CALL SKIPIT(IHOLD)
000337              GO TO 30
000340    45        CONTINUE

000340               MONTH=1
000341              CALL PRINTIT(MONTH,IOLDMO,IOLDYMD)
000344    9999      STOP
000346              END


SUMM

PROGRAM LENGTH INCLUDING I/O BUFFERS
010771

UNUSED COMPILER SPACE
010300


                    SUBROUTINE SKIPIT(IHOLD)
000003              DIMENSION IHOLD(132)
000003    10        CONTINUE

000003    1000      FORMAT(132R1)
000003              CALL BLANKIT(IHOLD)
000004              READ(1,1000) IHOLD
000014              IF(EOF,1)20,15
000020    15        CONTINUE
000020              IF(IHOLD(12).GE.1R0.AND.IHOLD(12).LE.1R9)RETURN
000033              GO TO 10
```

```
000034    20      RETURN
000035            END


SKIPIT

SUBPROGRAM LENGTH
000055

UNUSED COMPILER SPACE
013300


                  SUBROUTINE BLANKIT(IHOLD)
000003            DIMENSION IHOLD(132)
‖00003            DIMENSION IHOLD(132)
000003            DO 10 I=1,132
000005            IHOLD(I)=1OR
000007    10      CONTINUE
000011             RETURN
000011            END


BLANKIT

SUBPROGRAM LENGTH
000022

UNUSED COMPILER SPACE
013400


                  SUBROUTINE PRINTIT(MONTH,IOLDMO,IOLDYMD)
000006            COMMON/TOT/ TRF,ITSUSP,ITBOD,ITN,ITPO4
000006            COMMON/CONSTA/AREA,RFCOEFF,AREAN,CN,CONST
000006            COMMON/ARRY/ TRAIN(25,12),YRRAIN(25)
000006            DATA IXYEAR,JOLDMO/1,1/
000006            DATA IZERO,ZERO/0,.0/
000006            YRRF=YRRF+TRF
000010            IYRSUSP=IYRSUSP+ITSUSP
000011            IYRBOD=IYRBOD+ITBOD
000013            IYRN=IYRN+ITN
000014            IYRPO4=IYRPO4+ITPO4
000016            XRAINF=TRAIN(IXYEAR,IOLDMO)
000022            RAINAF=ACFT(XRAINF)
000024            RFAF=ACFT(TRF)
000026            DSET=TRAIN(IXYEAR,IOLDMO)-(TRF /CONST)
000036            DSETAF=ACFT(DSET)
‖00036            DSETAF=ACFT(DSET)
000041            YRDSET=YRDSET+DSET
000043            YRDSAF=YRDSAF+DSETAF
000045            YRAINAF=YRAINAF+RAINAF
000047            YRFAF=YRFAF+RFAF
000051            IF(JOLDMO.LT.IOLDMO)12,16
000057    12      CONTINUE
000057            LCOUNT=IOLDMO-JOLDMO
000061            DO 14 IXI=1,LCOUNT
000062            ENCODE(10,1040,IYM)IOLDYMD,IXI
```

```
000073             RAINAF2=0.
000074             RAINAF2=ACFT(TRAIN(IXYEAR,IXI))
000102             YRAINAF=YRAINAF+RAINAF2
000103             WRITE(2,1020)IYM,TRAIN(IXYEAR,IXI),ZERO,IZERO,IZERO
                 * ,IZERO,IZERO,ZERO,RAINAF2,ZERO,ZERO
000140    14       CONTINUE
000145    16      CONTINUE
000145             WRITE(2,1020)IOLDYMD,TRAIN(IXYEAR,IOLDMO),TRF,ITSUSP,ITBO
                 * ,ITN,ITP04,DSET,RAINAF,RFAF,DSETAF
000203    1020     FORMAT(X,R5,3X,2(2X,F9.2),4(2X,I9),2X,F9.2,3(2X,F9.0))
000203             TRF=ITSUSP=ITBOD=ITN=ITP04=DSET=RAINAF=RFAF=DSETAF=0
‖00203             TRF=ITSUSP=ITBOD=ITN=ITP04=DSET=RAINAF=RFAF=DSETAF=0
000215    05       CONTINUE
000215             IF(IOLDMO.GT.MONTH)GO TO 20
000222             IF(MONTH.EQ.IOLDMO+1) GO TO 10
000224             IOLDMO=IOLDMO+1
000225             ENCODE(10,1040,IOLDYMD)IOLDYMD,IOLDMO
000236    1040     FORMAT(A8,I2)
000236             RAINAF2=0.
000237             RAINAF2=ACFT(TRAIN(IXYEAR,IOLDMO))
000251             YRAINAF=YRAINAF+RAINAF2
000252    C
000253             WRITE(2,1020)IOLDYMD,TRAIN(IXYEAR,IOLDMO),TRF,
                 * ITSUSP,ITBOD,ITN,ITP04,DSET,RAINAF2,RFAF,DSETAF
000311             GO TO 05
000314    10       CONTINUE
000314             JOLDMO=MONTH
000315             IOLDMO=MONTH
000316             RETURN
000316    20       CONTINUE
000316             IF(IOLDMO.EQ.12) GO TO 25
000320             IOLDMO=IOLDMO+1
000321             ENCODE(10,1040,IOLDYMD)IOLDYMD,IOLDMO

000333             WRITE(2,1020)IOLDYMD,TRAIN(IXYEAR,IOLDMO),TRF,
                 * ITSUSP,ITBOD,ITN,ITP04,DSET,RAINAF,RFAF,DSETAF
‖                * ITSUSP,ITBOD,ITN,ITP04,DSET,RAINAF,RFAF,DSETAF
000373             GO TO 20
000376    25       CONTINUE
000376             WRITE(2,1010)YRRAIN(IXYEAR),YRRF,IYRSUSP,IYRBOD,IYRN,IYR
                 *,YRDSET,YRAINAF,YRFAF,YRDSAF
000426    1010     FORMAT(1X,*       *,3X,2(2X,F9.2),4(2X,I9),2X,F9.2,3(2X,F9
000426             IXYEAR=IXYEAR+1
000430             JOLDMO=1
000431             IOLDMO=MONTH
000433             YRRF=IYRSUSP=IYRBOD=IYRN=IYRP04=0
000440              YRDSET=YRDSAF=YRAINAF=YRFAF=0.
000444             RETURN
000445             END


PRINTIT

SUBPROGRAM LENGTH
000532

UNUSED COMPILER SPACE
011400
```

```
                     SUBROUTINE GETCOEF
000002               COMMON/CONSTA/AREA,RFCOEFF,AREAN,CN,CONST
000002               DIMENSION ITITLE1(10),ITITLE2(10),ITITLE3(10)
000002               DIMENSION IHOLD(132)
000002    10          CONTINUE
000002                READ(4,1000) I
000010    1000        FORMAT(1X,R1)
000010                IF(I.EQ.1R*) 20,10
000015    20          CONTINUE
‖00015    20          CONTINUE
000015                READ(4,1020)ITITLE1,ITITLE2,ITITLE3,NONURB
000031    1020        FORMAT(/////,10A10/10A10/10A10/////58X,I1
                    * //////////////////////)
000031                CALL SUMRAIN
000032                READ(4,1024) AREA
000040    1024        FORMAT(/////25X,F9.2)
000040    35          CONTINUE
000040                READ(4,1026) IHOLD
000046    1026        FORMAT(132R1)
000046               IF(IHOLD(50).NE.1RF.AND.IHOLD(51).NE.1RF) GO TO 35
000060               ENCODE(7,1027,COE)(IHOLD(I),I=75,81)
000074    1027       FORMAT(7R1)
000074               DECODE(7,1028,COE) RFCOEFF
000104    1028       FORMAT(F7.5)
000104                IF(NONURB.EQ.0)GO TO 50
000105    30          CONTINUE
000105                READ(4,1030) KEY
000113    1030        FORMAT(25X,R5)
000113                IF(KEY.EQ.5RAREAN)40,30
000120    40          CONTINUE
000120                READ(4,1050)AREAN,CN
000130    1050        FORMAT(23X,F7.1,3X,F5.2)
‖00130    1050        FORMAT(23X,F7.1,3X,F5.2)
000130                GO TO 55
000131    50          CONTINUE
000131                AREAN=CN=0.
000133    55         CONTINUE
000133                READ(4,1055)KEY
000141    1055        FORMAT(1X,R9)
000141                IF(KEY.NE.9RTREATMENT) GO TO 55
000143                READ(4,1057) KEYTITL
000151    1057        FORMAT(103X,R7)
000151                WRITE(2,1058) KEYTITL
000157    1058        FORMAT(1X,R7)
000157               WRITE(2,1060)ITITLE1,ITITLE2,ITITLE3
000171    1060        FORMAT(3(10A10,/))
000171                WRITE(2,1070)
000175    1070        FORMAT(1X,*NONURB*,10X,*AREA*,3X,*RUNOFF COEFF*
                   *  ,4X,*AREAN*,8X,*CN*)
000175                WRITE(2,1080)NONURB,AREA,RFCOEFF,AREAN,CN
000213    1080        FORMAT(6X,I1,5X,F9.2,5X,F7.5,5X,F7.1,5X,F5.2)
000213                CONST=((RFCOEFF*AREA)+(CN*AREAN))/(AREA+AREAN)
000221                WRITE(2,1090)CONST
000226    1090       FORMAT(1X,*CONSTANT= *,F8.5)
000226                WRITE(2,2000)
‖00226                WRITE(2,2000)
000232    2000        FORMAT(1X,*MONTH*,6X,*RAIN(IN)*,1X,*RUNOFF(IN)*,
                   *  7X,*SUSP*,8X,*BOD*,10X,*N*,8X,*PO4*,7X,
                   *  *DSET*,3X,*RAIN(AF)*,1X,*RUNOFF(AF)*,
                   *  3X,*DSET(AF)*)
```

```
000232          RETURN
000233          END


GETCOEF

SUBPROGRAM LENGTH
000653

UNUSED COMPILER SPACE
012100


                FUNCTION ACFT(XXX)
000003          COMMON/CONSTA/AREA,RFCOEFF,AREAN,CN,CONST
000003          ACFT=(XXX*(AREA+AREAN))/12.
000007          RETURN
000007          END


ACFT

SUBPROGRAM LENGTH
000022

UNUSED COMPILER SPACE
013400


                SUBROUTINE SUMRAIN
000002          COMMON/ARRY/TRAIN(25,12),YRRAIN(25)
000002          XMORAIN=0.
000003          READ(4,8000)IOLDYR,IOLDMO,RAIN
000015    8000  FORMAT(X,I4,X,I2,104X,F4.2)
          *READ RAINFALL DATA AND SUM FOR EACH MONTH
000015           ISTARYR=IOLDYR
000017    10    CONTINUE
000017    10    CONTINUE
000017          XMORAIN=XMORAIN+RAIN
000021          READ(4,8000)IYR,IMO,RAIN

          *SKIP IF HEADER DATA IS ENCOUNTERED .I.E. YEAR=0000

000033          IF(IYR.EQ.0000) GO TO 40

          *CHECK TO SEE IF MONTH HAS CHANGED

000034    15    CONTINUE
000034          IF(IOLDMO.NE.IMO) 20,10
000041    20    CONTINUE

          *ENTER RRAIN FOR MONTH IN PROPER ARRAY LOCATION

000041           I=IOLDYR-ISTARYR+1
000044          TRAIN(I,IOLDMO)=XMORAIN
000050          YRTEMP=YRTEMP+XMORAIN
000052          XMORAIN=0.
```

```
000052              IOLDMO=IMO

          *CHECK TO SEE IF YEAR HAS CHANGED

000053              IF(IOLDYR.NE.IYR) 30,10
000060    30        CONTINUE
000060              YRRAIN(I)=YRTEMP
000062              YRTEMP=0
000063              IOLDYR=IYR
000064              GO TO 10

          *SKIP HEADER AND CHECK IF RAINFALL DATA IS FINISHED
```

‖ *SKIP HEADER AND CHECK IF RAINFALL DATA IS FINISHED

```
000065    40        CONTINUE
000065              READ(4,8010) IYR,IMO,RAIN
000077    8010      FORMAT(////X,I4,X,I2,104X,F4.2)

          *IF YEAR IS EQUAL TO 0000 ON SECOND READ RAINFALL
          *DATA HAS ENDED

000077              IF(IYR.NE.0000) GO TO 15
000100              TRAIN(I,IOLDMO)=XMORAIN
000105              YRRAIN(I)=YRTEMP+XMORAIN
000107    9999      RETURN
000110              END


SUMRAIN

SUBPROGRAM LENGTH
000141

UNUSED COMPILER SPACE
013000
```

‖13000

```
AJYQHWI.  23.20.10. 77/02/18.
```

*************************************
*************************************

THIS IS   D I S P O S E D   OUTPUT.

IT  WILL  NOT  HAVE  A  CARD  DECK.

PLEASE PUT OUT FOR USER      9364003

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