TO: BOARD OF DIRECTORS

FROM: MICHAEL LEBRUN

DATE: APRIL 9, 2010

AGENDA ITEM
E-1
APRIL 14, 2010

RECEIVE WORK PRODUCT #1
2010 URBAN WATER MANAGEMENT PLAN UPDATE

ITEM

Water Systems Consulting will present initial work product from 2010 Urban Water Management Plan (UWMP) Update [RECEIVE REPORT AND GIVE DIRECTION]

BACKGROUND

On September 30, 2009, the Board of Directors selected Water Systems Consulting (WSC) to prepare the 2010 Urban Water Management Plan Update. On December 9, 2009, WSC reviewed the project scope and schedule with your Board.

At the December meeting your Board authorized an addition to the Project Scope of Work to include the computation of the baseline per capita water use within the District.

Today WSC will present and discuss the development of the Demand Database (Work Product #1) and computation of District per capita use.

The UWMP Update is currently on schedule to be completed in October 2010. The next scheduled presentation to your Board by WSC is of the Draft Update on September 8, 2010.

FISCAL IMPACT

The UWMP update expenditures are within budget. The Project is included in the FY 09-10 Budget.

RECOMMENDATION

Staff recommends that the Board receive report and give direction.

ATTACHMENTS

- Work Product 1 – Demand Database, March 15, 2010 Draft
- Baseline Daily Per Capita Water Use, March 17, 2010 Draft
- NCSD 2010 UWMP Update Schedule

t:\board matters\board meetings\board letter\2010\100414 uwmp.doc

WORK PRODUCT 1 - DEMAND DATABASE

Draft

NCSD 2010 Urban Water Management Plan ***March 15, 2010***

Reviewed by: Kevin Kennedy, P.E.
Jeffery Szytel, P.E.

Prepared by: Jeroen Olthof, P.E.

Background

As part of the development of a 2010 Urban Water Management Plan (UWMP), the Nipomo Community Services District (NCSD, or the District) is developing a database of current and projected future water demand. The database is being developed using Geographical Information Systems (GIS) tools to geographically reference current water users and develop focused estimates of potential future demands. This document describes the development of the database and summarizes the estimates of future demand.

Existing Data

Several existing data sets were provided by NCSD or San Luis Obispo County for use in this project. These included:

- A geodatabase called NCSD_Landbase.mdb that was last updated in March of 2010. This geodatabase is updated by the District on a monthly basis. The March 2010 file included three feature classes with parcel information:
  - NCSDParcels, showing 4,568 parcels in the NCSD service area with a total area of 3,917 acres. Attributes that could be present for each parcel included the Assessor Parcel Number (APN), the street address, the County zoning category, and the water account number.
  - NCSDSOIParcels, showing 1,920 parcels in the District's sphere of influence (SOI) with a total area of 5,719 acres.
  - SLOCOParcels, showing 16 parcels in the County to the northeast of the current service area. These parcels are not in District's service area or its SOI.
- A benefit unit assessment spreadsheet developed by the Wallace Group and provided in a Microsoft Excel file. It included information on current and potential future development for 4,498 parcels in the District's service area. Fields for each parcel included:
  - Assessor land use description
  - Physical land use
  - Development status
  - Existing residential unit value
  - Future development potential
  - Developed benefit units

- Undeveloped benefit units

- Five years of water consumption data from the District's billing system, referred to as the MOM database. The data were provided by fiscal year (FY), from FY 2004-05 through FY 2008-09. For each year a spreadsheet was provided showing the bi-monthly consumption in hundred cubic feet (hcf) at each location. The billing system includes a unique identification number called Location for each meter location. The billing system also stores an APN for each account that can be used to help correlate water use with geographic location.
- Monthly records of gross water production from the District's wells. These data were provided for each well from January 2000 through November 2009.
- A map showing the SOI areas identified with their numbers, from 1 to 8. The SOI areas as defined by NCSD are shown in Figure 1.
- A map showing the current zoning for the parcels in the study area, as defined by the County. The zoning information provided by the County in December 2009 is shown in Figure 2.

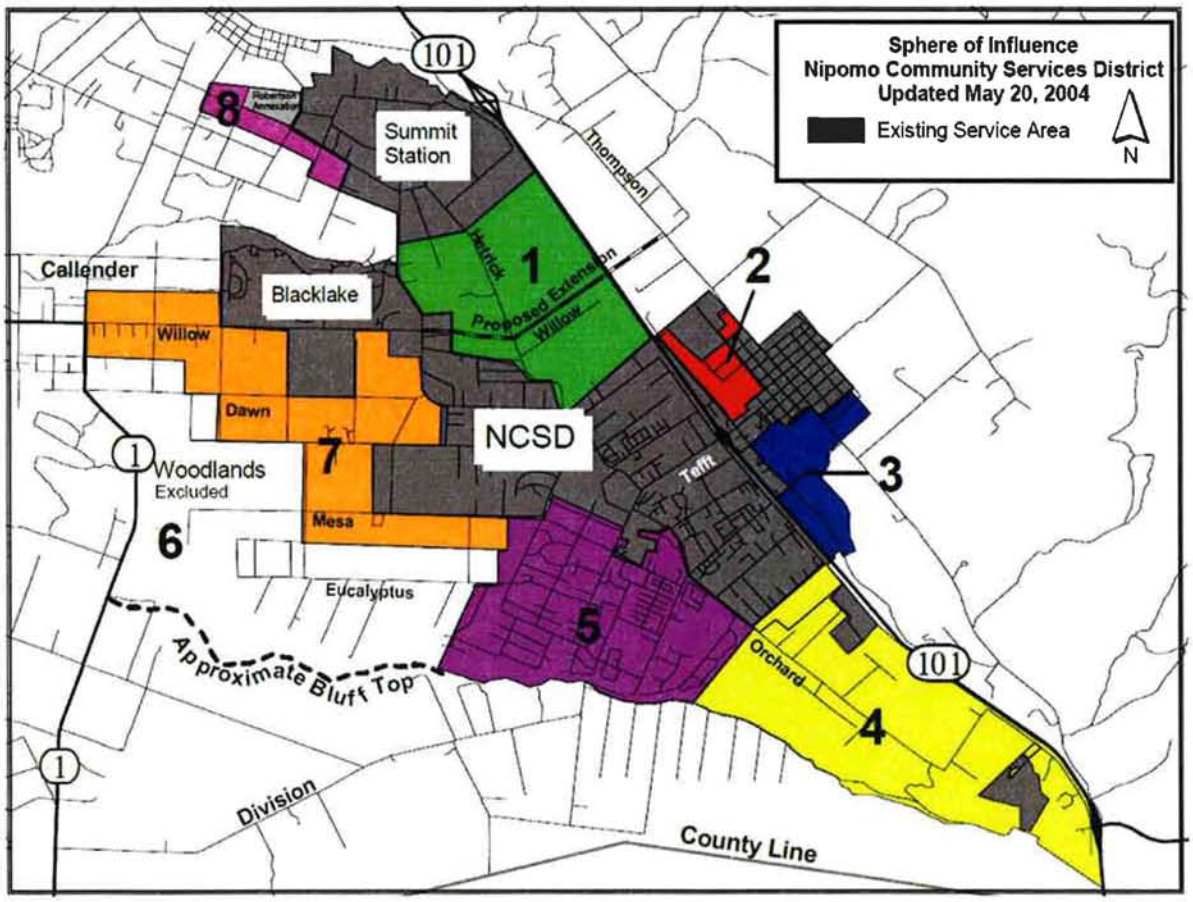


Figure 1. NCSD SOI Areas

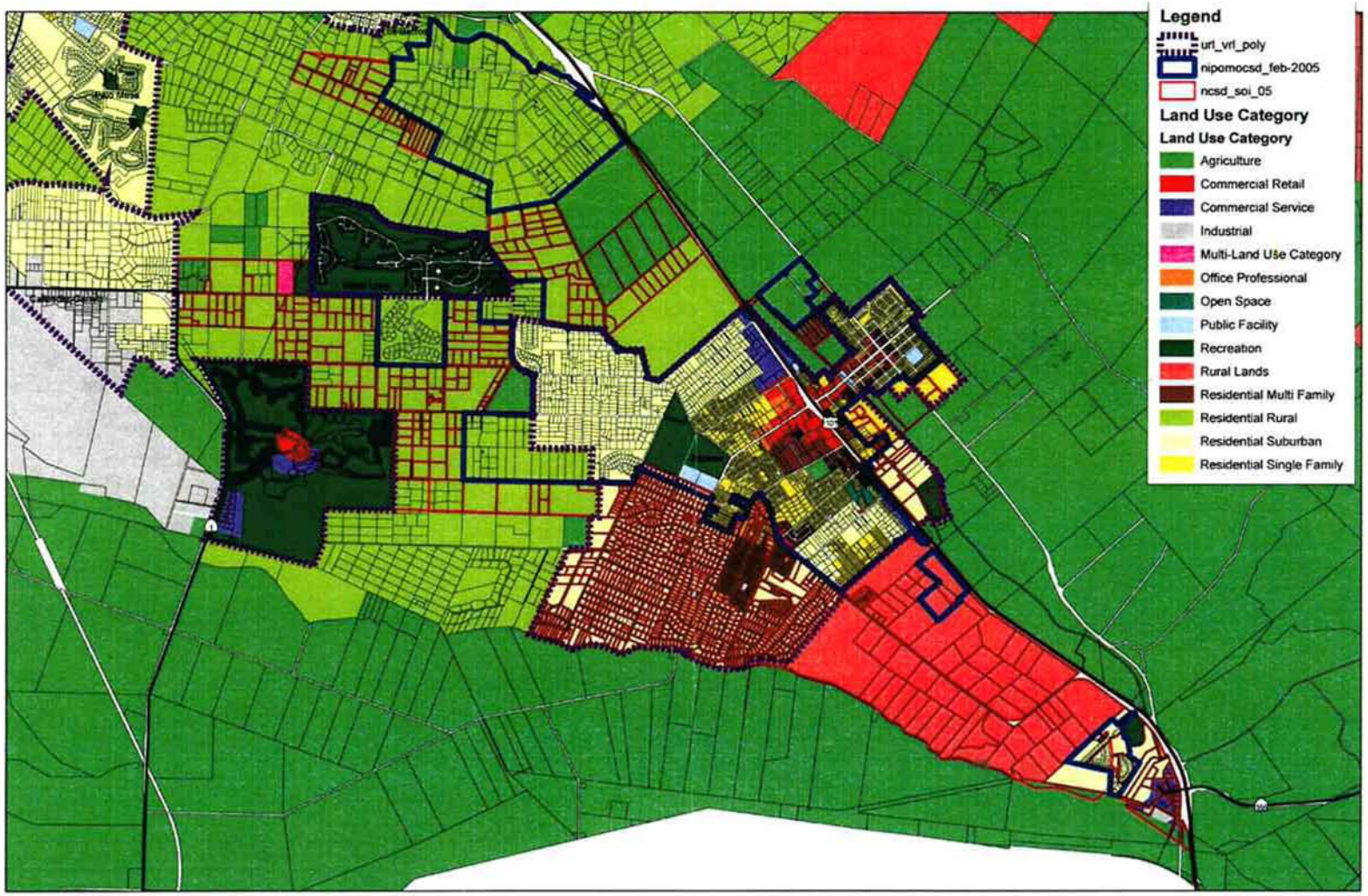


Figure 2. Zoning Map Provided by San Luis Obispo County (Line labeled url_vrl_poly shows Urban Reserve Line and Village Reserve Line)

UWMP Geodatabase

Using the NCSD_Landbase.mdb file as a reference, HDR created a new geodatabase called NCSD_UWMP.mdb. This geodatabase, formatted as a Microsoft Access file, will be a deliverable to NCSD. Geographic information in a geodatabase is stored in layers that are called feature classes. To help organize the information, feature classes can combined in groups that are called feature datasets. The UWMP geodatabase contains two feature datasets: one called Landbase that contains the feature classes maintained by NCSD, and one called UWMP that contains the information specific to this study. The coordinate system for these datasets is the North American Datum 1983 (NAD83), California State Plane, Zone 5, with units of feet. This coordinate system matches the GIS data provided by NCSD.

Parcels

In the UWMP geodatabase, HDR created a new data table by combining the tables associated with the NCSDParcels and SOIParcels feature classes into a single table. This combined table is called UWMP_Parcel_data and includes 6,488 parcels with a total area of 9,636 acres. The tables were combined to provide a single source of parcel information for use in demand projections. A field was added to identify the parcel's location as being in the NCSD service area or one of the seven SOI areas. Separate data can be generated as needed for any SOI area or for the NCSD service area by querying the data in this field.

Because NCSD updates the parcel information in the Landbase dataset on a monthly basis, HDR did not duplicate the geographic parcel boundaries in the UWMP dataset. The parcel data table includes a field called APN_DATA with a unique APN for each parcel. The parcel data table can be linked to the feature classes in the Landbase dataset using this APN_DATA field. When a new Landbase dataset becomes available, NCSD can import the new Landbase dataset into the UWMP geodatabase and overwrite the old information. With this arrangement, the information in the UWMP dataset can be linked to updated Landbase information as it becomes available.

HDR added additional fields to the UWMP_Parcel_data table to store information about current and potential future water use. Additional fields in the UWMP_Parcel_data table are summarized in Table 1.

Table 1. Fields in UWMP Parcels Data Table

Field Name	Description
APN_Data	The nine-digit APN, stored as text. Every parcel has a unique value.
MOM_APN	The APN in eight-digit format stored as text, without the leading zero. This value matches the APN format used in the MOM data.
NCSD	This text fields identifies each parcel either as within the District's service area ("NCSD") or in one of the seven sphere of influence areas (identified as SOI-1 through SOI-8, excluding SOI-6 which is the Woodlands).
Zoning	The zoning for the parcel, as defined by San Luis Obispo County. NCSD staff identified parcels that were covered by the Southland Specific Plan and the Canada Ranch Specific Plan. For these parcels, the specific plan provides more detailed information than the zoning category. HDR populated the zoning field with the name of the specific plan for these parcels.
URL_VRL	This field identifies the parcel as within the Urban Reserve Line (URL) of Nipomo, the Village Reserve Line (VRL) of Blacklake, or within the County (outside any URL or VRL).
Address	The street address of the parcel (if available).

The parcels in the District's service area and in the SOI areas are shown in Figure 3.

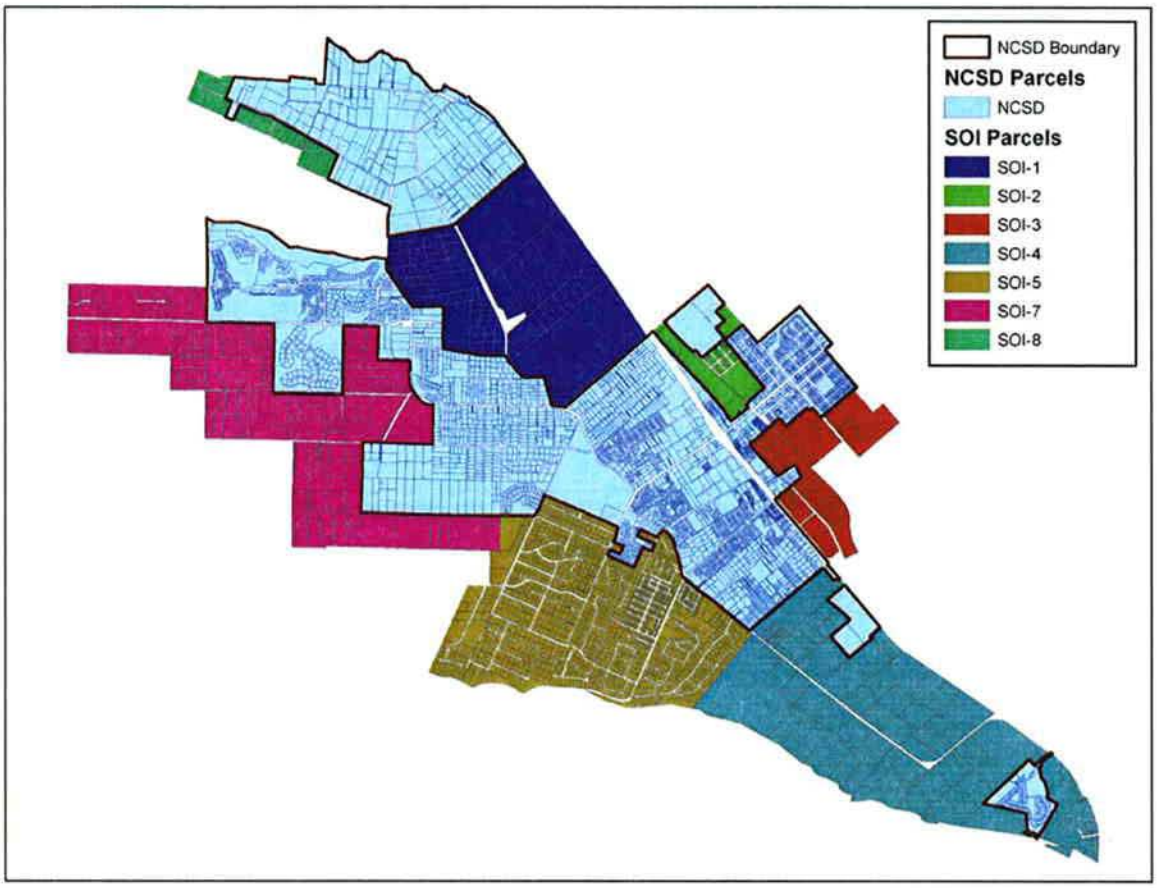


Figure 3. Parcels in District Service Area and SOI Areas

The SOI area designated SOI-4 is currently agricultural land and may be removed from the District's SOI. The District is currently providing comments to the San Luis Obispo County Local Agency Formation Commission (LAFCO), which is responsible for defining the future boundaries of the SOI.

The SOI area designated SOI-5 is currently served water by the Golden State Water Company. Because the District does not expect to ever provide retail water service to those parcels, SOI-5 was not included in any further analysis.

The parcels are shown color-coded by their location in a URL or VRL in Figure 4.

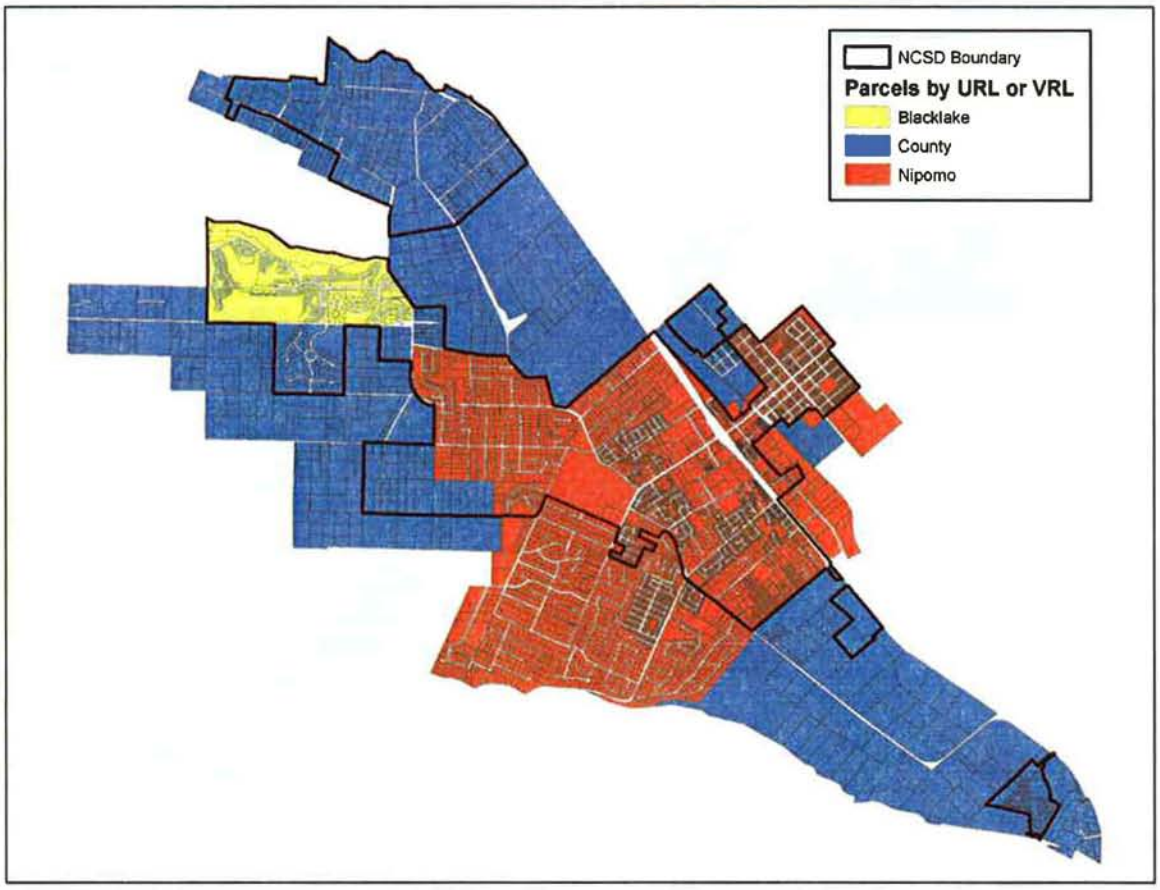


Figure 4. Parcels by Urban Reserve Line or Village Reserve Line

The parcels are shown color-coded by their County zoning or specific plan designation in Figure 5.

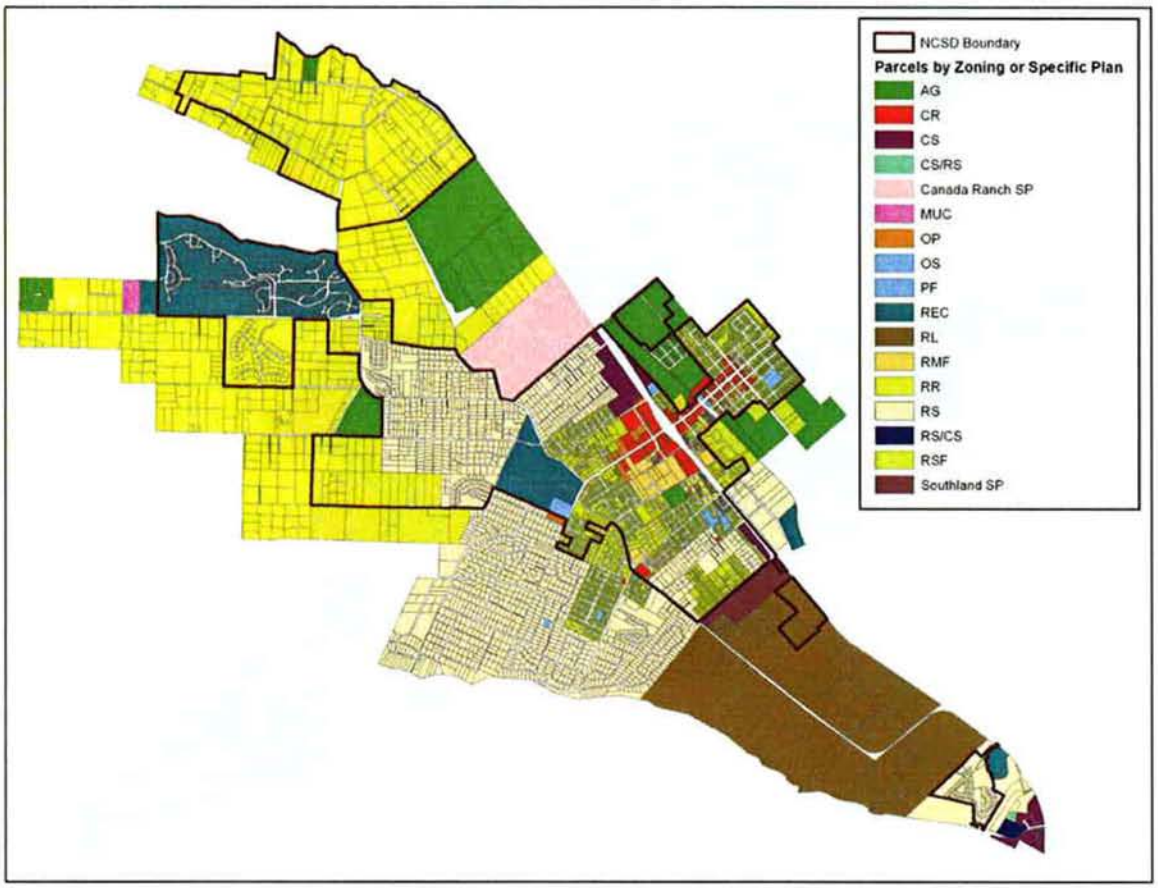


Figure 5. Parcels by County Zoning or Specific Plan

The zoning and specific plan codes used in the study area are summarized in Table 2. Some parcels are split zoned, meaning that two different zoning designations apply to different parts of the parcel. In the database these parcels have both zoning designations combined with a slash. For example, a parcel designated "CS/RS" includes a portion zoned Commercial Services and a portion zoned Residential Suburban.

Table 2. Zoning and Specific Plan Codes Used in the Study Area

Code	Description
AG	Agriculture
Canada Ranch SP	Canada Ranch Specific Plan area
CR	Commercial Retail
CS	Commercial Services
MUC	Multi-Land Use Category
OP	Office and Professional
OS	Open Space
PF	Public Facility
REC	Recreation
RL	Rural Lands
RMF	Residential Multi-Family
RR	Residential Rural
RS	Residential Suburban
RSF	Residential Single Family
Southland SP	Southland Specific Plan area
Note: Some parcels are split-zoned and have a designation that combines two categories (for example, "CS/RS"	

Based on the new geodatabase, the acres of each category in the service area and in the SOI areas are summarized in Table 3. The total acreage in Table 3 (8,433 acres) is less than the total acreage in the UWMP parcel data table (9,636 acres) because SOI-5 is being excluded from further analysis.

Table 3. Summary of Zoning and Specific Plan Designation in NCSD Service Area and SOI Areas (Acres)

Code	NCSD	SOI-1	SOI-2	SOI-3	SOI-4	SOI-7	SOI-8	Total
AG	104	390	119	125		89		826
CR	119		7					126
CS	74				37			112
CS/RS					3			3
MUC						19		19
OP	24							24
OS	11							11
PF	24							24
REC	593			21	19	19		653
RL	60				1,272			1,332
RMF	135							135
RR	1,316	391				1,240	117	3,064
RS	893			98	110			1,101
RS/CS					13			13
RSF	560		6	76				642
Canada Ranch SP		274						274
Southland SP					74			74
Total	3,913	1,055	132	320	1,529	1,367	117	8,433

Demand Locations

One of the District's objectives was to link water consumption data to the appropriate parcel so that water use could be analyzed geographically. It is possible for a parcel in the NCSD service area to have more than one water meter. Separate meters might be in place for indoor and irrigation water use, and some multiple-family developments have individual meters for each unit. Therefore, HDR created a point feature class in the geodatabase to represent water demand locations. These 4,180 points were located using a combination of the APN in the billing database, the street address in the billing database, and the water account number in the parcel database. Water use from the MOM database can be linked to these points using the MOM Location number. Historical water use by parcel can then be characterized in GIS by summarizing the water demand location points that fall within a parcel's boundaries. The fields in the water demand location feature class are summarized in Table 4.

Table 4. Fields in Water Demand Location Feature Class

Field Name	Description
Shape	A point showing the water demand location. Most points were generated by using the centroid of the parcel; they are not intended to represent the physical location of the meter within the parcel.
Location	The location number for that meter in the MOM database.
MOM_Addrss	The street address of the location, based on the information in the MOM database.
MOM_APN	The APN of the location, based on the information in the MOM database.
Source	The source of the information used to identify the location of the meter. This text field is used to describe how that point was located. Values include: • MOM APN matched GIS parcel APN (98%) • MOM location number matched water account number stored in GIS parcel table (1%) • Estimated from MOM street address (1%)

The water demand locations are color-coded by the information source in Figure 6.

Figure 6. Demand Location Points

As shown in Figure 6, the District does provide water service to some parcels outside its service area. Many of these services were established as part of agreements to provide easements or right-of-way for District infrastructure. These accounts outside the District are summarized in Table 5.

Table 5. District Demand Locations Outside District Boundary

Location Number	Status as of March 2010	Location Number	Status as of March 2010
20318	Active	0040048	Inactive
20407	Active	0040050	Inactive
20408	Active	0040051	Inactive
20409	Active	0040054	Inactive
20414	Active	0040062	Inactive
40046	Active	0040063	Inactive
40047	Active	0040064	Inactive
40049	Active	0040354	Inactive
40050	Active	0040356	Inactive
40051	Active	0040357	Inactive
40052	Active	0040358	Inactive
40053	Active	0040359	Inactive
40060	Active	0040360	Inactive
40061	Active	0040361	Inactive
40348	Active	0040363	Inactive
40355	Active	0040364	Inactive
40406	Active	0040365	Inactive
60973	Active	0040366	Inactive
		0040367	Inactive

Water Consumption

HDR compiled the five years of consumption data and calculated consumption for each demand location for each month from July 2004 through June 2009. Because NCSD issues water bills on a bi-monthly basis, most locations have a water consumption recorded every other month. This bi-monthly consumption must be divided by two and allocated to both months before evaluating seasonal consumption patterns.

During the compilation, some values of unusually high consumption were noted and reviewed with the District. The District provided corrected consumption values for the accounts shown in Table 6.

Table 6. Revised Consumption Values

Location	Month	Original Consumption (HCF)	Corrected Consumption (HCF)
20641	December 2005	99,953	35
50170	January 2006	997,665	*0*
30159	September 2008	-100	*0*
Note: Values in italics are assumed.			

The water consumption for all locations is summarized in Table 7. Table 7 also shows the consumption converted to acre-feet per year (AFY).

Table 7. Summary of Water Consumption Data

	Total Consumption (HCF)	Total Consumption (AFY)
FY05	1,125,351	2,583
FY06	1,113,537	2,556
FY07	1,205,284	2,767
FY08	1,194,947	2,743
FY09	1,123,069	2,578
Average	1,152,438	2,646

The monthly consumption data from the MOM database were linked to the layer of demand location points in the geodatabase. The layer of demand location points was then intersected with the parcels to determine the current water use by parcel. During the period from 2004 through 2009, there was no clear trend in consumption, although the FY09 consumption was slightly less than the FY05 consumption.

During any given year, some locations had no water use for part or all of the year. This situation could be due to ownership transitions or part-time residents. Some locations represent new structures that have not been in place for the full five years. During future years there will continue to be ownership transitions or periods of minimal water use at any given parcel. Because assuming 100-percent occupancy would result in an unreasonably high total demand, the consumption data were not adjusted to exclude locations or time periods with no water use.

The consumption data for the five years were classified according to the billing code in the MOM data. The District's billing codes are summarized in Table 8.

Table 8. NCSD Billing Codes

Code	Description	General Classification
B1	Blacklake - SFR	Single Family Residential
B2	Blacklake -MFR	Multi-Family Residential
B3	Blacklake - IRR	Irrigation
B4	Blacklake - COM	Commercial
B5	Blacklake - AGR	Agricultural
I1	In Town - SFR	Single Family Residential
I2	In Town - MFR	Multi-Family Residential
I3	In Town - IRR	Irrigation
I4	In Town - COM	Commercial
I5	In Town - AGR	Agricultural
O1	Out of Town - SFR	Single Family Residential
O2	Out of Town - MFR	Multi-Family Residential
O3	Out of Town - IRR	Irrigation
O4	Out of Town - COM	Commercial
O5	Out of Town - AGR	Agricultural
OS	High School	Institutional
X1	Cal Cities Emergency	Other
X2	Outside Hydrant Use	Other
X3	Hydrant Construction Water	Other
Z1	NCSD No Charge	Institutional

The consumption for any given period can be summarized by these classes. The breakdown for the five years of data is shown in Figure 7.

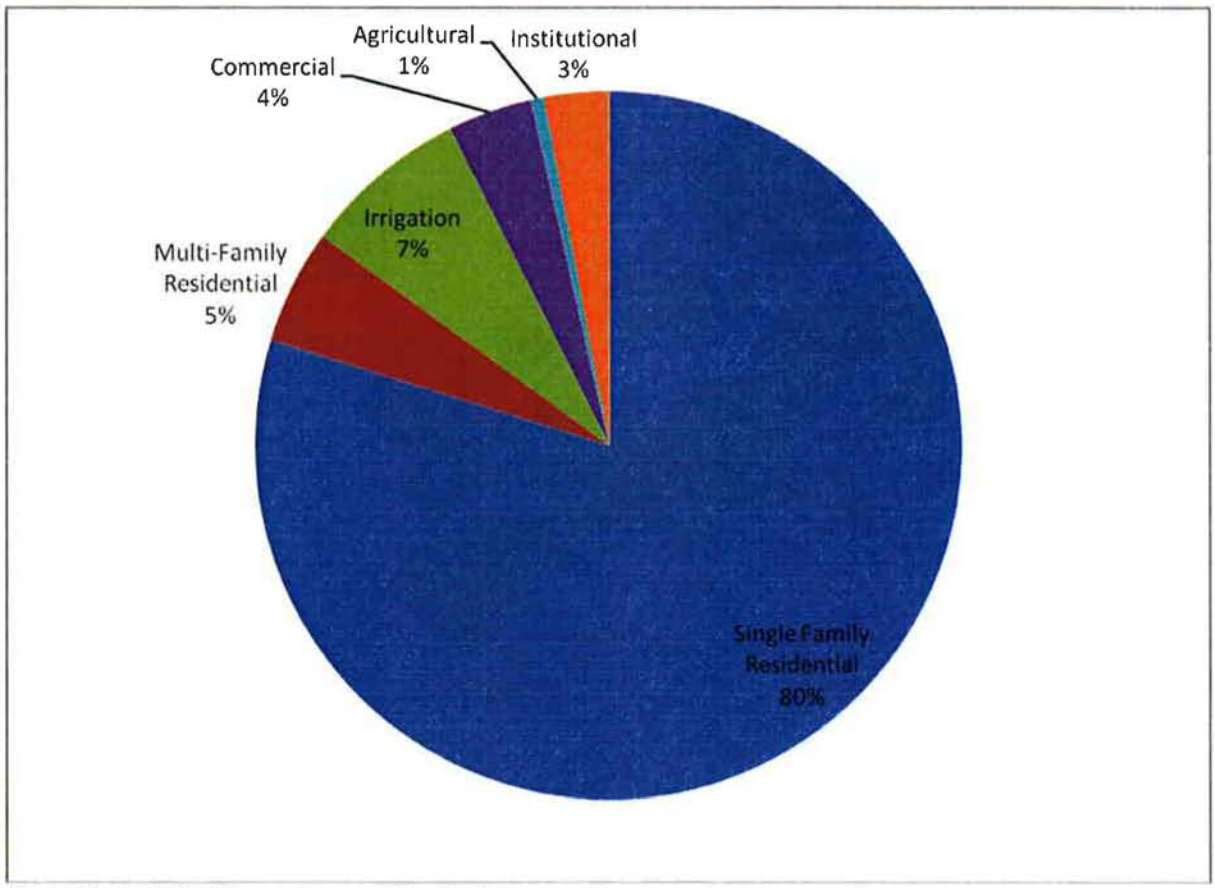


Figure 7. FY05-09 Water Consumption by Customer Class

The consumption data can also be analyzed geographically. The parcels in the study area are color-coded by their average water consumption (in AFY) in Figure 8.

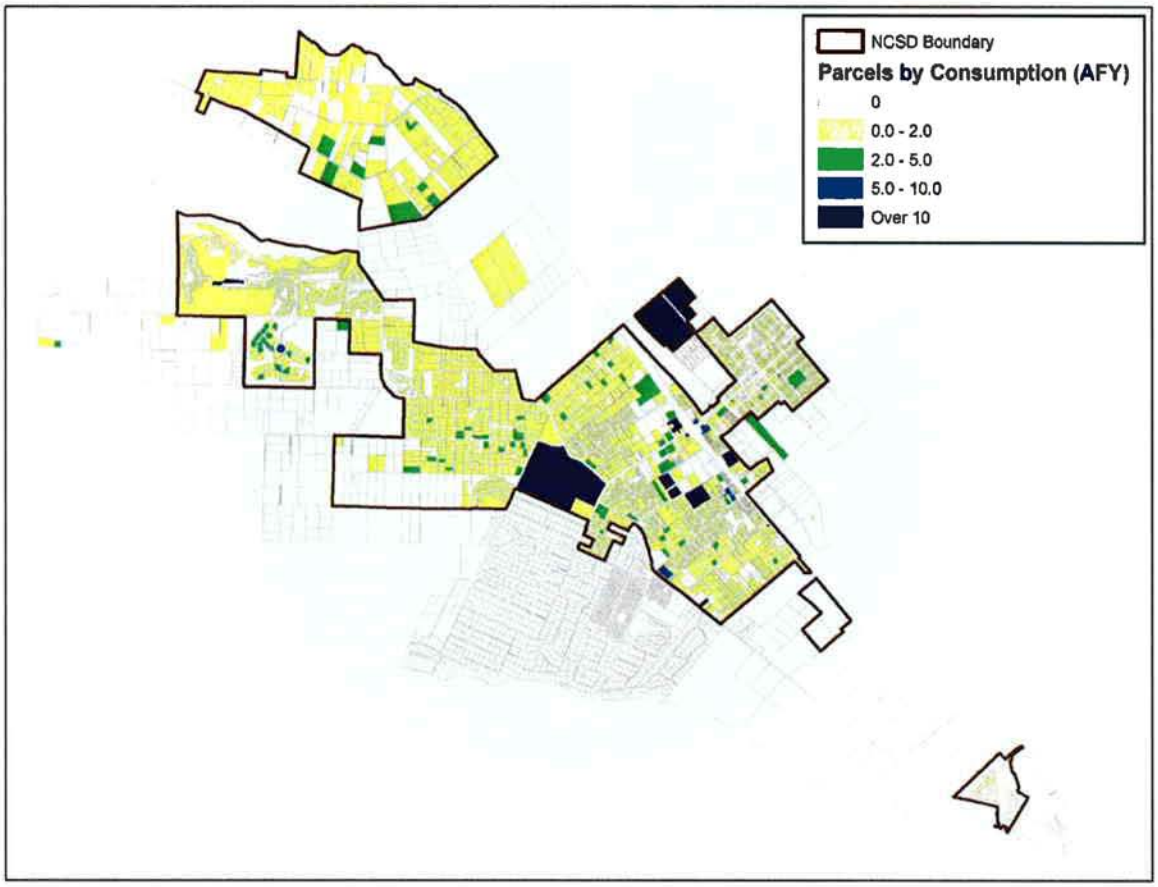


Figure 8. Parcels by Average Water Consumption

Water Production

NCSD provided ten years of monthly water production data from the District's wells. HDR compiled this information to calculate total monthly and annual production. The production information is summarized in Table 9.

Table 9. Annual NCSD Water Production

Calendar Year	Production (AF)		Fiscal Year	Production (AF)
2000	2,414		2001	2,410
2001	2,285		2002	2,494
2002	2,709		2003	2,616
2003	2,633		2004	2,827
2004	2,907		2005	2,643
2005	2,794		2006	2,747
2006	2,706		2007	2,982
2007	2,856		2008	2,843
2008	2,755		2009	2,642
Source: Annual Production Summaries Provided by NCSD				

The difference between production and consumption is considered to be non-revenue water (NRW). This NRW typically includes water used for unmetered uses, such as fire fighting or flushing, along with water lost to leaks in the distribution system.

One additional use of water for NCSD is deliveries to the Golden State Water Company. District staff provided recorded flows to Golden State for the years 2000 through 2009. These flows were added to the measured consumption by NCSD accounts to determine total consumption.

The compilation of total consumption and production is shown in Table 10.

Table 10. Consumption and Production Summary

	NCSD Consumption (HCF)	Golden State Delivery (HCF)	Total Consumption (HCF)	Total Consumption (AFY)	Total Production (AFY)	Non-Revenue Water (AFY)	NRW as Percent of Production
FY05	1,125,351	2,944	1,128,295	2,590	2,643	53	2%
FY06	1,113,537	17,460	1,130,997	2,596	2,747	151	5%
FY07	1,205,284	16,461	1,221,745	2,805	2,982	177	6%
FY08	1,194,947	1,015	1,195,962	2,746	2,843	97	3%
FY09	1,123,069	-	1,123,069	2,578	2,642	64	2%
Average				2,663	2,771	108	4%

Over the five most recent years of available data, the NRW varied from 2 to 6 percent of production, with an average of 4 percent. For future planning purposes, a rounded value of 5 percent was used.

Future Water Demands

Future water demands were estimated for the parcels in the study area (both the District's service area and the SOI). The future demand projections were made in two steps. First, a buildout water demand was calculated for each parcel. This estimate used the benefit unit assessment spreadsheet for areas in the District service area and the County zoning information for areas in the SOI. In the second step, interim projections were made for incremental periods between now

and buildout. These interim projections were prepared using regional population projections for 2010 through 2035. These population projections were based on planning work by the San Luis Obispo Council of Governments (SLOCOG) and San Luis Obispo County.

Water Demand at Buildout

As part of its planning process, San Luis Obispo County has been calculating the development potential for parcels in the rural areas of the County. This analysis includes potential constraints on development such as slope and environmentally sensitive habitat. The County is extending this analysis to include parcels in the more developed areas of the County. The results of the County's analysis were not available at the time this memorandum was prepared. When that information becomes available, it could potentially be used to estimate buildout levels of development and buildout water demands in the study area.

For this project the best available estimate of future development in the NCSD service area is documented in the benefit unit assessment spreadsheet developed by the Wallace Group. The spreadsheet was developed for the purpose of assessing costs to property owners for a new water supply (an interconnection to the City of Santa Maria). The benefit unit assessment spreadsheet provided by NCSD included data for 4,498 parcels with a total area of 3,741 acres.

In order to calculate water use for different types of development, the Wallace Group defined a "benefit unit." A benefit unit is approximately equivalent to one single-family residence. Parcels were assigned existing benefit units based on their size and current land use. The Wallace Group identified a total of 5,825 benefit units in the current service area. Based on the District's average annual water production from 2005 through 2009 of 2,771 AFY, the current water use per benefit unit is 425 gallons per day (gpd).

The Wallace Group also calculated future benefit units that are expected for each parcel in the current service area. This calculation was based on a review of available information including zoning, current land use, and field investigation of selected parcels. The number of future benefit units assigned to an undeveloped parcel was calculated using the information in Table 11.

Table 11. Basis of Benefit Unit Assessment

Group	Category	Description	Parcel Sizes	Benefit Units
1	RSF	Residential parcels with one unit	<= 0.3 acres	1.0
			0.4 to 0.6 acres	1.6
			>= 0.7 acres	2.0
2	RSF-2	Second unit	< 1.0 acres	0
			>= 1.0 acres	0.3 for second unit
3	RSF>2	Greater than 2 units	All	0.3 for each additional unit
4	RMF	Multi-family units with no land	<0.1	0.7
5	COM	Commercial Services, Commercial Retail, Office Professional	<= 0.3 acres	1.0
			0.4 to 0.6 acres	1.6
			0.7 to 1.9 acres	3.0
			>= 2.0 acres	6.0
6	Mini Storage	Storage units	All	0.5
7	School	School	<= 0.3 acres	1.0
			0.4 to 0.6 acres	1.6
			0.7 to 2.0 acres	3.0
			> 2.0 acres	3.0 plus 1.0 for every acre above 2
8	Public Meeting	Churches, public meeting facilities	<= 0.3 acres	1.0
			0.4 to 0.6 acres	1.6
			0.7 to 2.0 acres	2.0
			> 2.0 acres	1.0 per acre
9	Recreational	Parks, fields	All	1.0 per acre
10	Government	Fire station, police station	<= 0.3 acres	1.0
			0.4 – 0.6 acres	1.6
			0.7 to 2.0 acres	3.0
			> 2.0 acres	3.0 plus 1.0 for every acre above 2
11	PF w/o Irrigation	Public facilities with no irrigation	All	0.0
12	PF w/ Irrigation	Public facilities with irrigation	All	1.0 per acre
13	OS w/o Irrigation	Open space with no irrigation	All	0.0
14	OS with Irrigation	Open space with existing or potential irrigation	All	1.0 per acre
15	WWTP	Wastewater Treatment Plant		1.0

Source: May 2009 Sensitivity Analysis for the Basis of Assessment - Final

The Wallace Group identified a total of 2,953 additional benefit units for the parcels in the District's service area. Using the current average use of 425 gpd per benefit unit, this development would represent an additional demand of approximately 1,400 AFY.

HDR imported the benefit unit information into the new geodatabase and joined the benefit unit table to the parcel data table using the APN. With the initial join, 4,459 parcels in the benefit unit assessment spreadsheet were linked to a parcel in the GIS parcel data table. HDR investigated the remaining 39 parcels to see if the APN could be adjusted. For eighteen parcels, HDR adjusted the APN values so that the benefit unit assessment spreadsheet would join with the GIS parcel data table. The adjusted APN was selected based on the street address for each record in the benefit unit assessment spreadsheet. These changes are summarized in Table 12.

Table 12. Modifications to APN Values in Benefit Unit Assessment Spreadsheet

Parcel APN in Benefit Unit Assessment Spreadsheet	Adjusted APN for Join with Geodatabase
90079032	90079091
91240006	91247015
91240007	91244027
91244027	91247016
91240020	91247027
91240021	91247028
91240023	91247029
91240031	91247039
91240032	91247040
91240034	91247042
91240035	91247043
91240075	91247010
91240077	91247014
91240081	91247044
91240082	91247045
91240084	91247037
92241022	92241035
92241027	92241034

While there were 22 parcels in the benefit unit assessment spreadsheet that remained without a link to a parcel in the GIS parcel data table, these represented less than 1 percent of the parcels and of the calculated benefit units. These discrepancies may be resolved when the Wallace Group updates the benefit unit assessment spreadsheet with updated APN information.

The benefit unit assessment spreadsheet did not include parcels outside the District's current service area. At some point the District may elect to expand the benefit unit assessment spreadsheet to calculate benefit units for the approximately 450 parcels in SOI-1, SOI-2, SOI-3, SOI-4, SOI-7, and SOI-8. For this project, detailed information about each SOI parcel was not available. Therefore, HDR used an alternate approach to estimate future demands for SOI

parcels. The approach matches the one used in the 2007 Water and Sewer Master Plan. For areas in the sphere of influence, future demands at buildout were estimated using the zoning or specific plan designation for the parcel and a set of demand factors summarized in Table 13.

Table 13. Water Demand Factors

Code	Description	Demand Factor from 2007 Master Plan (Revised Using FY05-06 Water Use Rates) (AFY/acre)	Demand Factor for 2010 Urban Water Management Plan (AFY/acre)
AG	Agriculture	0	0
CR	Commercial Retail	1.42	1.42
CS	Commercial Services	0.35	0.35
MUC	Multi-Land Use Category		1.42
OP	Office and Professional	0.26	0.26
OS	Open Space	1.18	1.18
PF	Public Facility	0.59	0.59
REC	Recreation	0.98	0.98
RL	Rural Lands	0.10	0.10
RMF	Residential Multi-Family	3.75	3.75
RR	Residential Rural	0.20	0.20
RS	Residential Suburban	0.98	0.98
RSF	Residential Single Family	2.10	2.10
Canada Ranch SP	Canada Ranch Specific Plan	1.96	1.96
Southland SP	Southland Specific Plan	0.98	0.98

Notes: Demand factor for MUC (Multi-Land Use Category) was assumed to be equal to CS (Commercial Services).
For parcels with a combination of two zoning categories, the demand factor was estimated as the average of the two values

For the new geodatabase, HDR used one of three methods to calculate the buildout water use for each parcel.

- For parcels in the current service area with no additional benefit units in the benefit unit assessment spreadsheet, the future demand was assumed equal to the average consumption from FY05 through FY09. An allowance of 5 percent for NRW was added to the consumption values.
- For parcels in the current service area with additional benefit units in the benefit unit assessment spreadsheet, the future demand was assumed equal to the current consumption (average of FY05 through FY09) plus 425 gpd for each additional benefit unit. An NRW allowance of 5 percent was added to the consumption values for current development. Because the future demand factor of 425 gpd per benefit unit was calculated using total production, it already includes NRW.

- For parcels in the sphere of influence, the future demand was calculated using the zoning or specific plan designation and the demand factors in Table 13. An allowance of 5 percent for NRW was added to demands calculated using the factors in Table 13.

The calculated buildout demands are summarized in Table 14.

Table 14. Estimated Buildout Demands

Area	Current Demand (AFY)	Additional Future Demand (AFY)	Total Buildout Demand (AFY)
Existing Service Area	2,753	1,387	4,140
SOI-1	3	646	649
SOI-2	-	24	24
SOI-3	6	290	296
SOI-4	-	367	367
SOI-7	9	309	318
SOI-8	-	25	25
Total	2,771	3,047	5,818
Note: Includes estimate of 5% for non-revenue water.			

Interim Years

The parcel geodatabase allows the calculation of current and estimated future water demand for each parcel. The District will be able to make assumptions about when certain parcels are developed and see the impact on future water demands. Land use planning for the study area is controlled by the County; the District's role is to plan for potential future growth and identify necessary water supplies. At this time, the County has not identified a specific order or sequence for the development of parcels. Therefore, HDR prepared projections of water demands during future years by assuming growth rates that can be applied across the study area.

San Luis Obispo County maintains several GIS datasets on their web site that can be used for planning projects. A shapefile of the 2000 census blocks was obtained from the County's data repository. This file has 2000 population in each of approximately 7,200 census blocks covering the County; the total population is 246,681. Approximately 220 census blocks overlay some part of the District's service area or sphere of influence. The census blocks in the study area are shown in Figure 9.

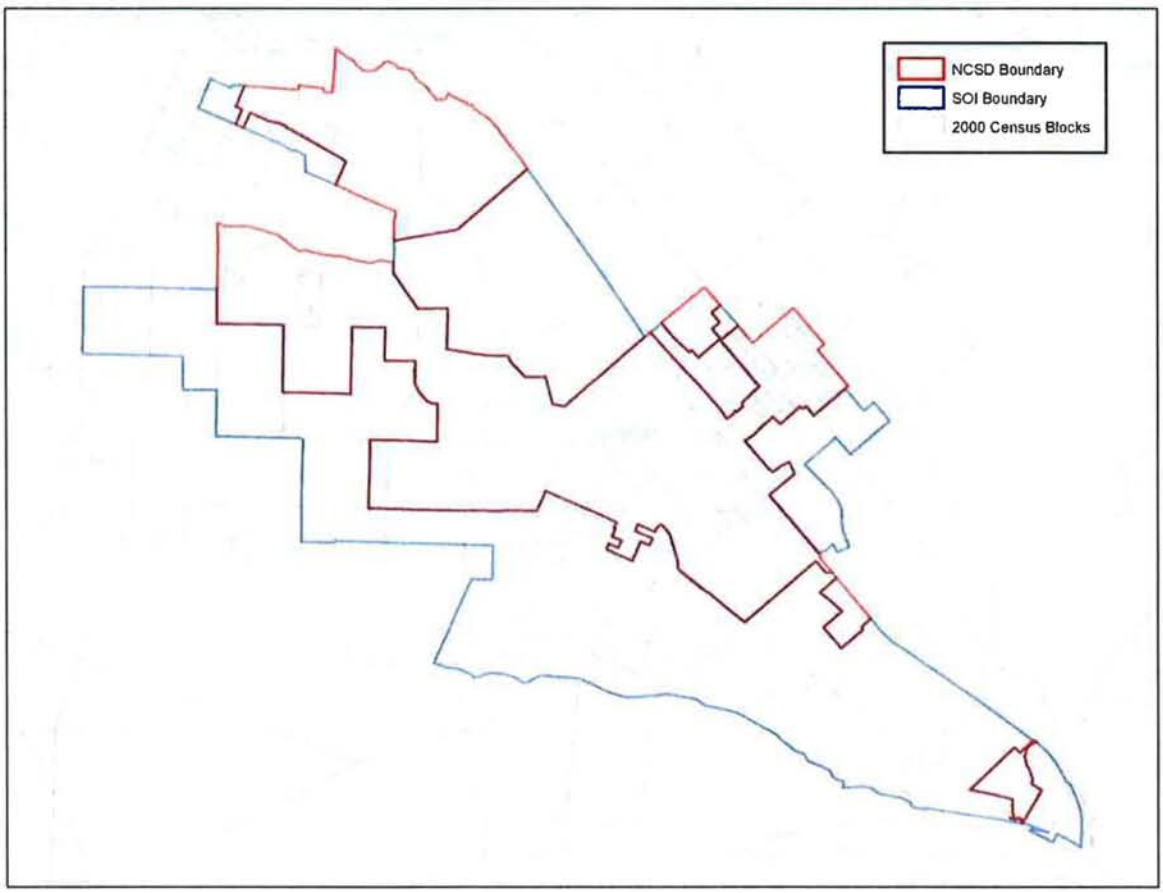


Figure 9. Census Blocks in Study Area

The distribution of population within each census block depends on the mix of residential, commercial, and other developed land uses. For this project, HDR assumed the population was uniformly distributed within each census block. For each census block, an area was calculated in acres and a 2000 population per acre was calculated.

In order to estimate the population within the service area, the layer of census blocks was intersected with the District service area boundary polygon. Similar intersections were done with the SOI boundary and the URL boundary, which corresponds to the Nipomo area as defined by the County in planning projections. These results are shown in Table 15.

Table 15. 2000 Population from Census Block Data

Area	2000 Population
NCSD Service Area	8,706
NCSD Sphere of Influence	5,484
Total NCSD	14,190
Nipomo URL	11,472
Source: GIS intersection of 2000 census blocks and adminstrative boundaries	

The most recent population projections for the study area have been estimated by the San Luis Obispo Council of Governments (SLOCOG) and updated by San Luis Obispo County. These estimates were provided by the County in a Microsoft Excel spreadsheet and reflected projections adopted by SLOCOG June 10, 2009. These projections include population estimates for the urban and rural areas throughout the County for years from 2000 through 2035. HDR extracted the estimates for the Nipomo URL area and for the South County (rural) area, which includes portions of the District's SOI. These estimates are summarized in Table 16.

Table 16. SLOCOG Population Projections

Timeframe	Nipomo URL	Annual Growth	South County (rural)	Annual Growth
2000	12,612		9,002	
2005	13,789	1.8%	9,746	1.6%
2008	14,726	2.2%	10,347	2.0%
2010	15,256	1.8%	10,677	1.6%
2015	16,419	1.5%	11,200	1.0%
2020	17,429	1.2%	11,589	0.7%
2025	18,460	1.2%	11,888	0.5%
2030	19,669	1.3%	12,267	0.6%
2035	20,672	1.0%	12,893	1.0%
Buildout	24,032		15,798	
Source: June 2009 SLOCOG projections prepared by ERA and County staff (Medium Growth Estimate). *Note: South County (rural) includes Black Lake and Woodlands*				

The SLOCOG-estimated population for 2000 for the Nipomo URL (12,612) is approximately 10 percent higher than the population calculated by HDR using census data (11,472). In order to maintain consistency with regional planning efforts, the SLOCOG value was retained.

The annual water production was assumed to increase in proportion to the population increases projected by SLOCOG for the Nipomo URL. The projected demands are summarized in Table 17. Table 17 also shows projected demands that account for the reduction in per-capita water use called for in Senate Bill 7. It was assumed that the expected reduction in per-capita water use from 222.7 gpd to 195 gpd would result in a corresponding percentage reduction in water production. The reduction in per-capita water use is further discussed in the Technical Memorandum "Baseline Daily Per Capita Water Use' (Water Systems Consulting, March 17, 2010).

Table 17. Estimated Water Demand for Interim Years and Buildout for the District Service Area

Timeframe	Annual Growth	Annual Production without Per-Capita Reduction (AFY)	Expected Per-Capita Water Use (gpd)	Annual Production with Per-Capita Reduction (AFY)
2010		2,771	222.7	2,771
2015	1.5%	2,982	219.3	2,937
2020	1.2%	3,166	195.0	2,772
2025	1.2%	3,353	195.0	2,936
2030	1.3%	3,573	195.0	3,128
2035	1.0%	3,755	195.0	3,288
Buildout		4,140	195.0	3,625

References

Baseline Daily Per Capita Water Use, Water Systems Consulting, March 17, 2010.

Draft NCSD Assessment District Research Memorandum, Wallace Group, April 15, 2009.

Nipomo Community Services District Sphere of Influence Update and Municipal Service Review, San Luis Obispo County Local Agency Formation Commission, May 20, 2004.

Nipomo Community Services District Sphere of Influence Update and Municipal Service Review Final Environmental Impact Report, San Luis Obispo County Local Agency Formation Commission, May 20, 2004.

Nipomo Community Services District Urban Water Management Plan 2005 Update, SAIC Engineering, January 25, 2006.

Nipomo Community Services District Water and Sewer Master Plan Update, Cannon Associates, December 2007.

Sensitivity Analysis for the Basis of Assessment – Final, Wallace Group, May 28, 2009.

Technical Memorandum

WSC
Water Systems Consulting, Inc.

Date: 3/17/2010

To: Mr. Michael LeBrun
Nipomo Community Services District
148 S. Wilson Street
Nipomo, CA 93444

Phone: (805) 929-1133

Prepared by: Jeffery Szytel, PE

Project: NCSD 2010 Urban Water Management Plan Update

SUBJECT: **BASELINE DAILY PER CAPITA WATER USE - DRAFT**

This memorandum presents the methodology used to calculate baseline daily per capita water use for the Nipomo Community Services District (NCSD or the District) as required by Senate Bill x 7-7 (SB 7) and the California Water Code (as amended). The baseline daily per capita water use is used to calculate the urban water use target (equal to 80% of baseline daily per capita water use) and the interim urban water use target (equal to 90% of baseline daily per capita water use). These values will be reported in the District's 2010 Urban Water Management Plan (UWMP).

Background

On November 10, 2009, Governor Arnold Schwarzenegger signed SB 7 into law. The legislation requires all water suppliers to achieve a reduction in per capita water use of 20% by December 31, 2020, with an interim target of 10% reduction by December 31, 2015. The legislation requires each urban water supplier to develop, and include in its UWMP, estimates of: 1) baseline daily per capita water use; 2) urban water use target; 3) interim urban water use target; and 4) compliance daily per capita water use. The UWMP must also include bases for determining the estimates, with references to supporting data. However, SB 7 did not include a detailed description of the allowable methodologies for determining the required values. Instead, it required California Department of Water Resources (CA-DWR) to develop appropriate methodologies and criteria, and to make them available to water suppliers no later than October 1, 2010. In consideration of this delay, the bill extended the deadline for submission of the 2010 UWMP to July 1, 2011.

In connection with preparation of the District's 2010 UWMP update, NCSD hired Water Systems Consulting, Inc. (WSC) to develop the required estimates described by SB 7. To facilitate completion of the 2010 UWMP project by the end of 2010, the District directed WSC to apply methodologies consistent with those described in an earlier draft of the legislation, Preprint Assembly Bill No. 2, and proceed with developing the estimates prior to CA-DWR issuing guidance. The selected methodology includes the following basic steps:

1. Calculate average gross daily water use per capita, reported in gallons per capita per day, based on gross water use and service area population for a continuous 10-year period ending no earlier than December 31, 2004.
2. Calculate the urban water use target (equal to 80% of baseline daily per capita water use)
3. Calculate the interim urban water use target (equal to 90% of baseline daily per capita water use)

4. Calculate the compliance daily per capita water use (equal to the gross daily water use per capita during the final year of the reporting period (i.e. 2009))

Gross Water Use

SB 7 defines gross water use as:

> *"The total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following: (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier; (2) The net volume of water that the urban retail water supplier places into long-term storage; (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.; (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24."*

Subdivision (f) of Section 10608.24 states:

> *"An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use."*

The only water entering NCSD's distribution system is groundwater production. NCSD supplies recycled water to irrigate the golf course at Blacklake, however it is accounted-for separately. From 1994 through present, NCSD has not placed any water into long-term storage. NCSD has emergency connections with Golden State Water Company and Woodlands Mutual Water Company. The District provided flow records for deliveries to Golden State Water Company from 2000 through 2009. Since demand from NCSD's three designated agricultural customers will be incorporated into the District's UWMP, the agricultural water use may be incorporated into gross water use. Therefore, gross water use is taken as the District's total groundwater production less the amount conveyed to Golden State Water Company in any given year.

NCSD provided annual production records from January, 2000 through November, 2009 in Excel format, as well as CA-DWR Public Water System Statistics (DWR Annual Reports) from 1989 through 2009. NCSD also provided records of total volume of water conveyed to Golden State Water Company from 2000 through 2009. Table 1 summarizes NCSD's production from 1994 through 2009, the volume of water delivered to Golden State Water Company, and the annual gross water use estimates for those years. There were inconsistencies in total production between the District's production spreadsheet and the DWR Annual Reports for the years 2002 and 2006. For 2002, the monthly production for December was excluded from the DWR Annual Report. For 2006, the DWR Annual Report shows 186.63 acre-ft produced in December, while the District's production spreadsheet shows 166.29 acre-ft. For 2002 and 2006, data from the District's production spreadsheet were used for gross water use.

Table 1. Summary of Gross Water Use for NCSD

Year	Annual Production from Production Spreadsheet, acre-feet/year	Annual Production from DWR Reports, acre-feet/year	Volume of water conveyed to Golden State Water Company, acre-feet/year	Gross Water Use, acre-feet/year
1994		1,718.00		1,718.00
1995		1,805.00		1,805.00
1996		1,934.70		1,934.70
1997		2,036.86		2,036.86
1998		1,909.74		1,909.74
1999		2,271.20		2,271.20
2000	2,414.51	2,414.51	17.57	2,396.94
2001	2,285.04	2,285.02	0.00	2,285.04
2002	2,709.32	2,520.79	0.00	2,709.32
2003	2,633.33	2,633.33	0.00	2,633.33
2004	2,907.83	2,907.83	0.25	2,907.58
2005	2,794.05	2,794.04	6.76	2,787.29
2006	2,706.42	2,726.77	40.08	2,666.34
2007	2,856.15	2,856.15	37.79	2,818.36
2008	2,755.23	2,755.24	2.33	2,752.90
2009		2,698.18	0.00	2,698.18

Population Estimates and Projections

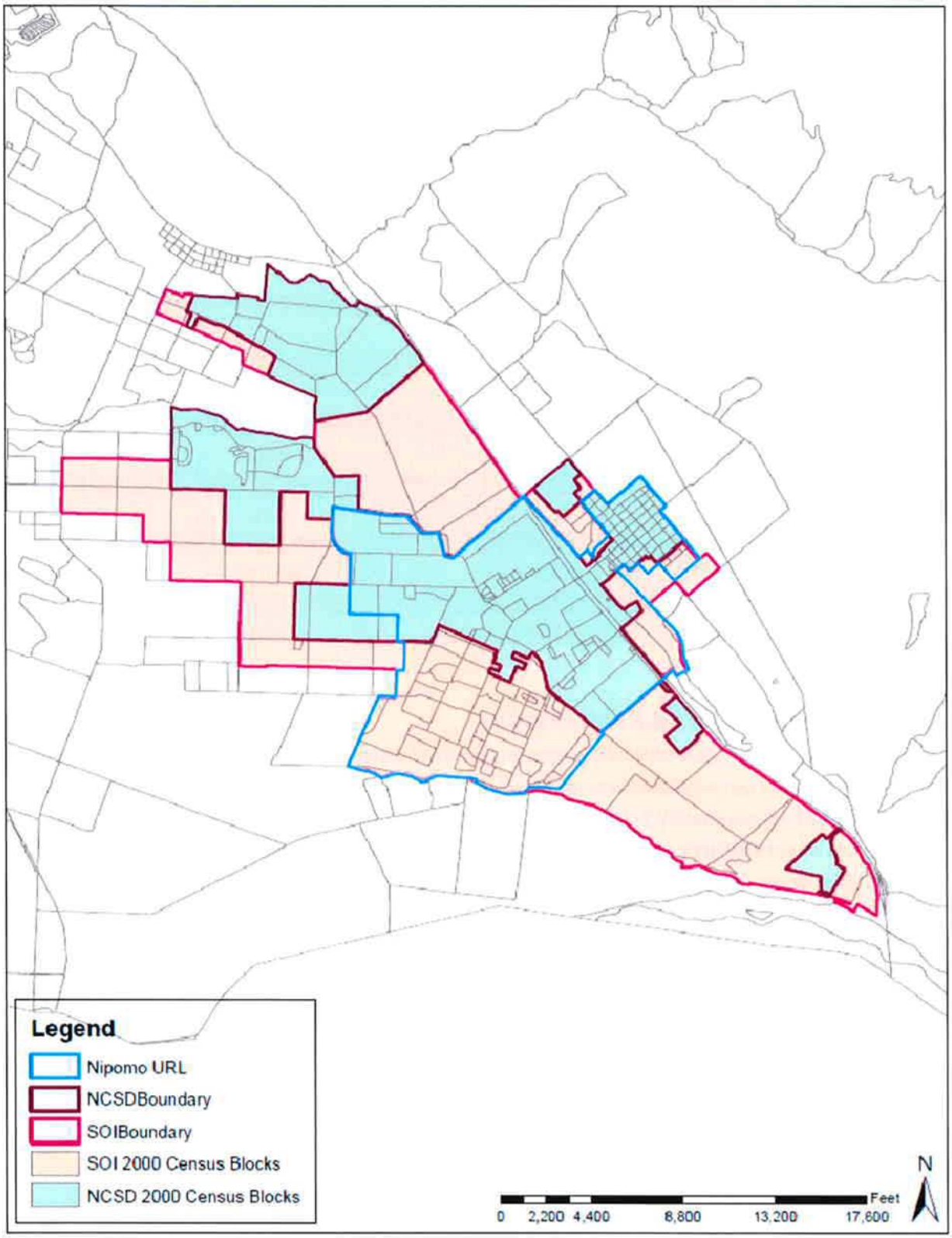
San Luis Obispo County maintains several GIS datasets on their website that can be used for planning projects. A GIS shapefile of the 2000 census blocks was obtained from the County's data repository. This file has 2000 population in each of approximately 7,200 census blocks covering the County. Approximately 220 census blocks overlay some part of the District's service area or sphere of influence (SOI). Figure 1 shows the census blocks in relation to NCSD's service area boundary and SOI.

The County's data included a total population for each census block in the dataset based on the 2000 census. Actual population distribution within each census block can vary based on development and land use patterns. For the purposes of this analysis, the distribution of population within each census block was assumed to be uniform, and WSC calculated persons per acre for each census block. The NCSD service area boundary was intersected with the census block boundaries to calculate the area of each block within NCSD's service area. WSC then applied the persons per acre for each census block to the area of each block within NCSD's service area to calculate total population within NCSD's service area. Table 2 shows the resulting estimate of population within the District's boundary for the year 2000.

Table 2. Estimated Population within NCSD Service Area for the year 2000

Area	2000 Population
NCSD Service Area	8,706

Figure 1. 2000 Census Blocks, Nipomo URL, NCSD Service Area Boundary, and SOI



Once the 2000 population was calculated, WSC used the number of residential connections given in the DWR Annual Reports to calculate a population per residential connection factor as shown in Table 3. This factor is much lower than NCSD's historical population per connection factor of 3.4. The historical factor of 3.4, which was used in the District's 2005 UWMP, appears to have been derived from County population data for "Nipomo". According to the County's planning staff, the "Nipomo" line item in their population estimates is based on the area within the Nipomo Urban Reserve Line (URL). As shown in Figure 1, the Nipomo URL does not coincide with the NCSD service area boundary, and includes large developed areas not served by the District. Therefore, the County's population estimates for "Nipomo" do not represent the population served by NCSD and should not be used to calculate population per connection or per capita demands.

Table 3. Population per Residential Connection

Year	# of Residential Connections	2000 Census Population	Population per Residential Connection
2000	3,183	8,706	2.74

The population per residential connection factor of 2.74 was applied to the number of residential connections for each year from 1994-2009, taken from the DWR Annual Reports, to estimate population in the District's service area for those years. Table 4 summarizes the resulting population estimates.

Table 4. Estimated Population Served within NCSD Service Area

Year	# of Residential Connections	Population per Residential Connection	Estimated Population Served within NCSD Service Area
1994	2,413	2.74	6,612
1995	2,526	2.74	6,921
1996	2,615	2.74	7,165
1997	2,721	2.74	7,456
1998	2,872	2.74	7,869
1999	3,037	2.74	8,321
2000	3,183	2.74	8,706
2001	3,283	2.74	8,995
2002	3,332	2.74	9,130
2003	3,353	2.74	9,187
2004	3,589	2.74	9,834
2005	3,703	2.74	10,146
2006	3,813	2.74	10,448
2007	3,893	2.74	10,667
2008	3,902	2.74	10,691
2009	3,947	2.74	10,815

As a check for the population estimates between 1994 and 2000, WSC calculated the total population within the District's service area in 1990 using the same methodology described above (using 1990 census data) and calculated interim year populations using linear interpolation. Figure 2 shows the 1990 census block boundaries, Table 5 shows the estimated population in 1990, and Table 6 compares the two estimates. The resulting population estimates varied by less than 3% in each year when compared to the estimates developed using NCSD's connection data. WSC opted to utilize annual population estimates based on NCSD's residential connection data and a uniform factor of 2.74 persons per connection to calculate per capita water use for the years 1994 through 2009.

Table 5. Estimated Population within NCSD Service Area for the year 1990

Area	1990 Population
NCSD Service Area	5,064

Figure 2. 1990 Census Blocks, Nipomo URL, NCSD Service Area Boundary, and SOI

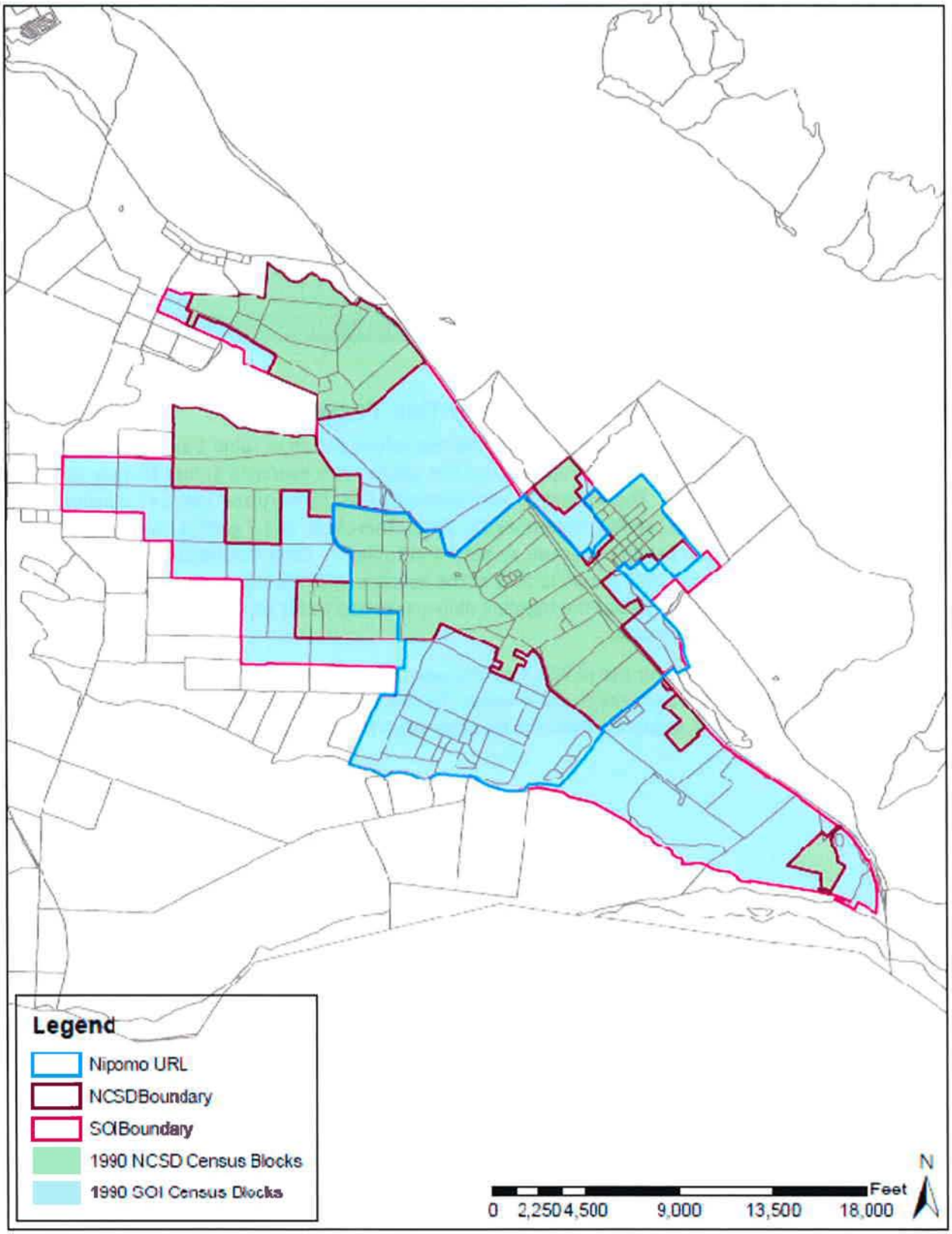


Table 6. Comparison of Population Estimates, 1994-2000

Year	Population based on census data and linear interpolation	Population based on NCSD connection data and 2.74 persons per connection	% Difference
1994	6,521	6,612	1.37%
1995	6,885	6,921	0.52%
1996	7,249	7,165	1.17%
1997	7,613	7,456	2.12%
1998	7,978	7,869	1.38%
1999	8,342	8,321	0.25%
2000	8,706	8,706	0.00%

Baseline Per Capita Water Use and Water Use Targets

WSC calculated per capita water use using the gross water use values shown in Table 1 and the population estimates shown in Table 4. The annual per capita water use values were averaged across 10-year periods ending no earlier than December 31, 2004. The highest 10-year average of per capita water use, 243.7 gallons per capita per day, was for the 10-year period ending December 31, 2005. Therefore, 243.7 gallons per capita per day was selected as the baseline daily per capita water use, as shown in Table 7. Table 8 summarizes the resulting values for the urban water use target for 2020 (equal to 80% of the baseline daily per capita water use), the interim urban water use target for 2015 (equal to 90% of the baseline daily per capita water use), and the compliance daily per capita water use (based on 2009 values).

The compliance daily per capita water use of 222.7 gallons per capita per day represents a reduction in per capita water use of approximately 8.6% from the baseline value. To comply with SB 7, the District will need to demonstrate an additional 1.4% reduction from the baseline value by 2015, and an additional 11.4% reduction from the baseline value by 2020.

Table 7. Per Capita Water Use Estimates

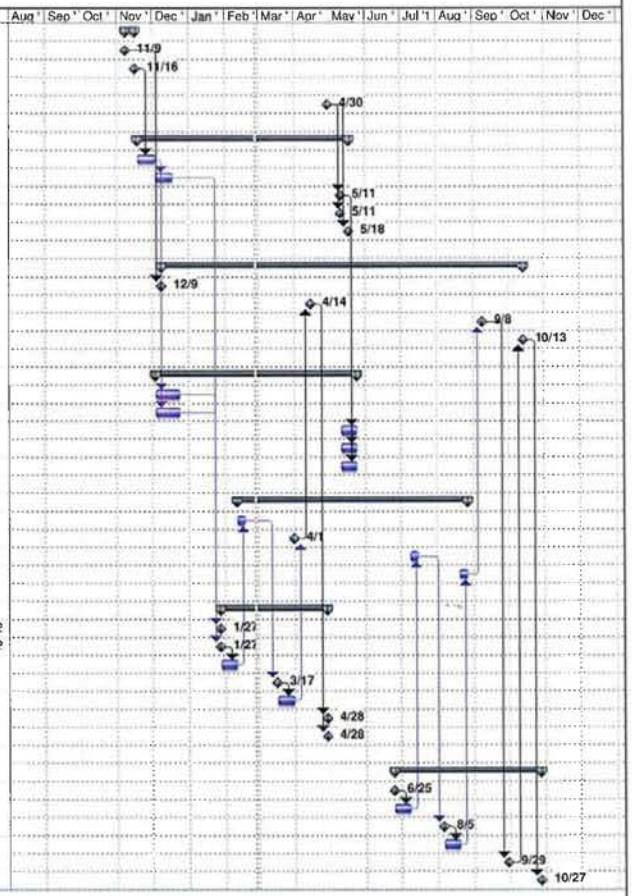
Year	Gross Water Use, acre-ft/year	Population Served	Per Capita Water Use, gal/capita/day	10 Year Average of Per Capita Water Use, gal/capita/day
1994	1,718.00	6,612	232.0	
1995	1,805.00	6,921	232.8	
1996	1,934.70	7,165	241.1	
1997	2,036.86	7,456	243.9	
1998	1,909.74	7,869	216.7	
1999	2,271.20	8,321	243.7	
2000	2,396.94	8,706	245.8	
2001	2,285.04	8,995	226.8	
2002	2,709.32	9,130	264.9	
2003	2,633.33	9,187	255.9	
2004	2,907.58	9,834	264.0	
2005	2,787.29	10,146	245.2	**243.7**
2006	2,666.34	10,448	227.8	243.2
2007	2,818.36	10,667	235.9	242.8
2008	2,752.90	10,691	229.9	241.5
2009	2,698.18	10,815	222.7	242.1

Table 8. Baseline, Target, Interim, & Compliance Water Use Values

Description	Water Use, gal/capita/day	Compliance Year
Baseline Gross Water Use	243.7	
Target Water Use (80%)	195.0	2020
Interim Water Use (90%)	219.3	2015
Compliance (2009) Water Use	222.7	2009

NCSD 2010 UWMP Update

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project Initiation**	**8 days**	**Mon 11/9/09**	**Mon 11/16/09**	
2	Notice to Proceed	0 days	Mon 11/9/09	Mon 11/9/09	
3	Kickoff Meeting	0 wks	Mon 11/16/09	Mon 11/16/09	
4					
5	Final NMMA TG Annual Report, 2009	0 days	Fri 4/30/10	Fri 4/30/10	
6					
7	**Workshops**	**180 days**	**Thu 11/19/09**	**Tue 5/18/10**	
8	Workshop #1 – Background Data Review	3 wks	Thu 11/19/09	Thu 12/3/09	3FS+2 days
9	Workshop #2 – Database Development and Demand Projections	3 wks	Fri 12/4/09	Fri 12/18/09	8
10	Workshop #3 – Supply Analysis	0 days	Tue 5/11/10	Tue 5/11/10	5FS+7 days
11	Workshop #4 – Recycled Water Planning	0 days	Tue 5/11/10	Tue 5/11/10	5FS+7 days
12	Workshop #5 – Conservation & Water Shortage Contingency Planning	0 days	Tue 5/18/10	Tue 5/18/10	5FS+7 days
13					
14	**Board Meetings**	**25 days**	**Wed 12/9/09**	**Wed 10/13/10**	
15	Scope and Schedule Review	0 days	Wed 12/9/09	Wed 12/9/09	2
16	Review of Draft WP#1	0 days	Wed 4/14/10	Wed 4/14/10	29FS+1 day
17	Draft UWMP Board Meeting	0 days	Wed 9/8/10	Wed 9/8/10	31FS+1 day
18	Final Draft UWMP Board Meeting	0 days	Wed 10/13/10	Wed 10/13/10	47FS+1 day
19					
20	**Agency Meetings**	**172 days**	**Fri 12/4/09**	**Mon 5/24/10**	
21	County Planning	21 days	Fri 12/4/09	Thu 12/24/09	8
22	LAFCO	21 days	Fri 12/4/09	Thu 12/24/09	8
23	NCSD's Representatives on NMMA Technical Group	14 days	Tue 5/11/10	Mon 5/24/10	10
24	City of Santa Maria	14 days	Tue 5/11/10	Mon 5/24/10	10
25	Other Agency Meetings	14 days	Tue 5/11/10	Mon 5/24/10	10
26					
27	**Deliverable Review Meetings with NCSD Staff**	**197 days**	**Thu 2/11/10**	**Thu 8/26/10**	
28	Review Meeting #1 - Admin Draft of WP#1	7 days	Thu 2/11/10	Wed 2/17/10	36
29	Review Meeting #2 - Draft of WP#1	0 days	Thu 4/1/10	Thu 4/1/10	38
30	Review Meeting #3 - Admin Draft of UWMP	7 days	Fri 7/9/10	Thu 7/15/10	44
31	Review Meeting #4 - Draft of UWMP	7 days	Fri 8/20/10	Thu 8/26/10	46
32					
33	**Work Product #1**	**91 days**	**Wed 1/27/10**	**Wed 4/28/10**	
34	Draft TM - Baseline Per Capita Water Use	0 wks	Wed 1/27/10	Wed 1/27/10	9FS+8 wks,21,22
35	Administrative Draft of WP #1	0 days	Wed 1/27/10	Wed 1/27/10	9FS+8 wks,21,22
36	NCSD Review of Admin Draft of WP#1	14 days	Thu 1/28/10	Wed 2/10/10	35
37	Draft of WP#1	0 days	Wed 3/17/10	Wed 3/17/10	28FS+21 days
38	NCSD Review of Draft of WP#1	15 days	Wed 3/17/10	Wed 3/31/10	37
39	Final TM - Baseline Per Capita Water Use	0 days	Wed 4/28/10	Wed 4/28/10	16FS+14 days
40	Final of WP#1	0 days	Wed 4/28/10	Wed 4/28/10	16FS+14 days
41					
42	**2010 UWMP**	**125 days**	**Fri 6/25/10**	**Wed 10/27/10**	
43	Admin Draft 2010 UWMP	0 mons	Fri 6/25/10	Fri 6/25/10	
44	NCSD Review of Admin Draft UWMP	14 days	Fri 6/25/10	Thu 7/8/10	43
45	Draft of UWMP	0 days	Thu 8/5/10	Thu 8/5/10	30FS+21 days
46	NCSD Review of Draft UWMP	14 days	Fri 8/6/10	Thu 8/19/10	45
47	Final Draft 2010 UWMP	0 days	Wed 9/29/10	Wed 9/29/10	17FS+21 days
48	Final 2010 UWMP	0 days	Wed 10/27/10	Wed 10/27/10	18FS+14 days



Project: NCSD 2010 UWMP Update
Date: Fri 2/26/10

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone