CITY OF MORRO BAY
PLANNING COMMISSION
MEETING AGENDA

Veteran's Memorial Building — 209 Surf Street, Morro Bay
Regular Meeting 6:00 p.m. — Monday February 1, 2010

Nancy Johnson - Chairperson
Vice-Chairperson - Gerald Luhr — Commissioner - John Diodati
Commissioner - Michael Lucas — Commissioner - Jamie Irons
Bruce Ambo - Secretary

I. CALL MEETING TO ORDER

II. PLEDGE OF ALLEGIANCE

III. ROLL CALL

IV. ELECTION OF CHAIR AND VICE-CHAIR

V. ACCEPTANCE OF AGENDA

VI. DIRECTOR'S REPORT/WRITTEN COMMUNICATIONS

A. Oral Report

VII. PUBLIC COMMENT

Members of the audience wishing to address the Commission on matters other than scheduled hearing items may do so when recognized by the Chairman, by standing and stating their name and address. Comments should be limited to three minutes.

VIII. CONSENT CALENDAR

IX. PRESENTATIONS

Informational presentations are made to the Commission by individuals, groups or organizations, which are of a civic nature and relate to public planning issues that warrant a longer time than Public Comment will provide. Based on the presentation received, any Planning Commissioner may declare the matter as a future agenda item in accordance with the General Rules and Procedures. Presentations should normally be limited to 15-20 minutes.

A. Presentation from Dan Doris, Building Official, on Graywater systems.

X. FUTURE AGENDA ITEMS

A. Downtown Visioning (Planning Commission Subcommittee).
B. Restrictions/rules on installing gates on driveways for residential and commercial properties.
C. Research information on allowing front porches within the front setback.
D. Presentation from Rob Livick, City Engineer, on the Pedestrian Plan.
E. Staff presentation on the Affordable Housing Rehabilitation Program and general affordable housing issues.

XI. PUBLIC HEARINGS

A. **Site Location:** 221 Main Street
Applicant: Dan Yates
Request: Conditional Use Permit #UP0-279 for a 178 square foot addition of living space and Parking Exception #AD0-048 for an open tandem parking space. This site is located within the Coastal Commission Appeals Jurisdiction.
Recommended CEQA Determination: Categorically Exempt, Class 1, Section 15301.
Staff Recommendation: Conditionally approve.
Staff Contact: Kathleen Wold, Senior Planner, 772-6211

XII. OLD BUSINESS

A. Current Planning Processing List/Advanced Work Program
B. 2009 Annual Water Report

XIII. NEW BUSINESS

XV. ADJOURNMENT

Adjourn to the next regularly scheduled Planning Commission meeting at the Veteran's Memorial Building, 209 Surf Street, on Tuesday February 16, 2010 at 6:00 p.m.

PLANNING COMMISSION MEETING PROCEDURES

Materials related to an item on this Agenda submitted to the Planning Commission after distribution of the agenda packet are available for public inspection in the Public Services Office at 955 Shasta Avenue, during normal business hours, Mill's ASAP, 495 Morro Bay Boulevard, or Morro Bay Library, 695 Harbor, Morro Bay, CA 93442. Planning Commission meetings are conducted under the authority of the Chair who may modify the procedures outlined below. The chair will announce each item. Thereafter, the hearing will be conducted as follows:

1. The Planning Department staff will present the staff report and recommendation on the proposal being heard and respond to questions from commissioners.

2. The Chair will open the public hearing by first asking the project applicant/agent to present any points necessary for the commission, as well as the public, to fully understand the proposal.

3. The Chair will then ask other interested persons to come to the podium to present testimony either in support of or in opposition to the proposal.

4. Finally, the Chair may invite the applicant/agent back to the podium to respond to the public testimony. Thereafter, the Chair will close the public testimony portion of the hearing and limit further discussion to the commission and staff prior to the commission taking action on a decision.

RULES FOR PRESENTING TESTIMONY

Planning Commission hearings often involve highly emotional issues. It is important that all participants conduct themselves with courtesy, dignity and respect. All persons who wish to present testimony must observe the following rules:

1. When you come to the podium, first identify yourself and give your place or residence both orally and on the sign in sheet at the podium. Commission meetings are audio and video tape-recorded and this information is required for the record.

2. Address your testimony to the Chair. Conversation or debate between a speaker at the podium and a member of the audience is not permitted.

3. Keep your testimony brief and to the point. Speak about the proposal and not about individuals. On occasion, the Chair may place time limits on testimony: Focus testimony on the important parts of the proposal: do not repeat points made by others. Please, no applauding or making comments from the audience during the testimony of others.

4. Written testimony is encouraged so they can be distributed in the packets to the Planning Commission. However, letters are most effective when presented at least a week in advance of the hearing. Written testimony provided after the staff reports are distributed and up to the meeting will also be distributed to the Planning Commission but there may not be enough time to fully consider the information. Mail should be directed to the Public Services Department, attention: Planning Commission Secretary.

APPEALS

If you are dissatisfied with any aspect of an approval or denial of a project, you have the right to appeal this decision to the City Council up to 10 calendar days after the date of action. The appeal form is available at the Public Services Department and on the City's web site. If legitimate coastal resource issues related to our Local Coastal Program are raised in the appeal, there is no fee if the subject property is located with the Coastal Appeal Area. If the property is located outside the Coastal Appeal Area, the fee is $250 flat fee. If a fee is required, the appeal will not be considered complete if the fee is not paid. If the City decides in the appellant's favor then the fee will be refunded.

City Council decisions may also be appealed to the California Coastal Commission pursuant to the Coastal Act Section 30603 and the City Zoning Ordinance. Exhaustion of appeals at the City is required prior to appealing the matter to the California Coastal Commission. The appeal to the City Council must be made to the City and the appeal to the California Coastal Commission must be made directly to the California Coastal Commission Office. These regulations provide the California Coastal Commission 10 working days following the expiration of the City appeal period to appeal the decision. This means that no construction permit shall be issued until both the City and Coastal Commission appeal period have expired without an appeal being filed.

The Coastal Commission's Santa Cruz Office at (831) 427-4863 may be contacted for further information on appeal procedures.

HEARING IMPAIRED: There are devices for the hearing impaired available upon request at the staff's table.

COPIES OF VIDEO, CD: Copies of the video recording of the meeting may be obtained through AGP Video at (805) 772-2715, for a fee.

ON THE INTERNET: This agenda may be found on the Internet at: http://www.morro-bay.ca.us/planningcommission

This Agenda is available for copying at Mills Copy Center and at the Public Library

AGENDA ITEM NO. VIII
DATE: 2·1·10
ACTION:

THE MINUTES FROM THE

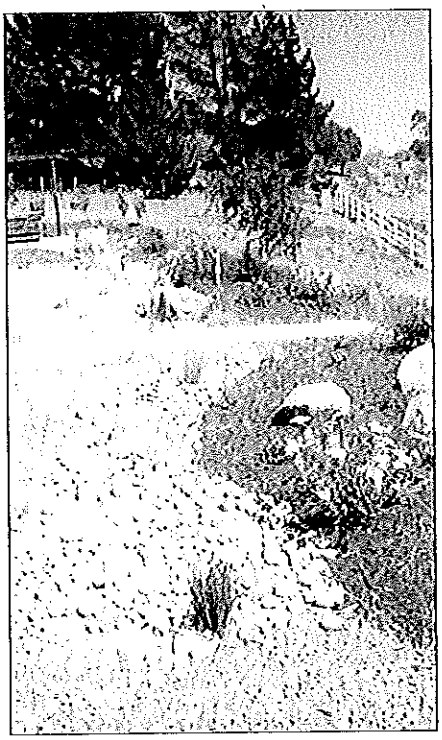
JANUARY 19, 2010
PLANNING COMMISSION MEETING

WILL BE ON THE FEBRUARY 16, 2010 AGENDA

SAN LUIS OBISPO GUIDE TO THE USE OF

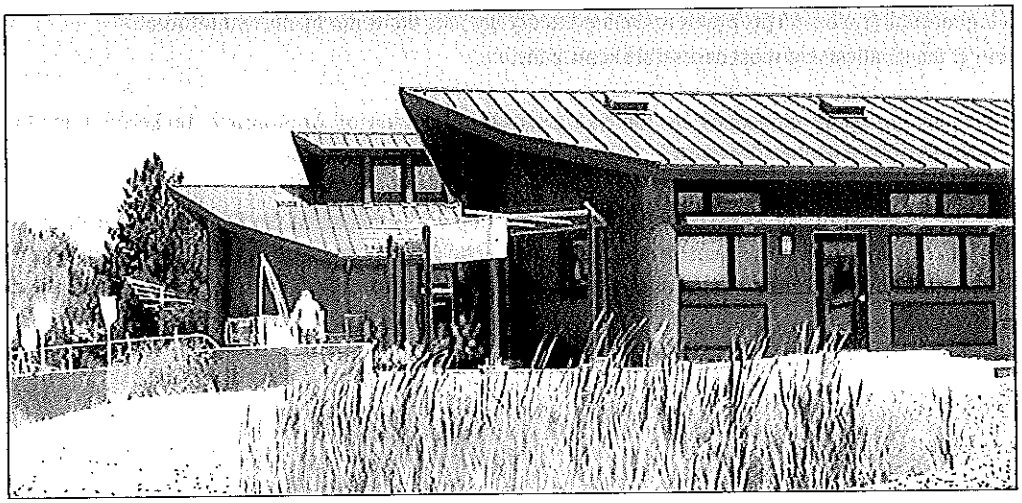
GRAYWATER

AGENDA ITEM NO: IX-A
DATE: February 1, 2010
ACTION: _____



Vegetated leach field, page 15.

Constructed wetland reed beds, page 21-22.



SLO Botanic Garden building uses a constructed wetland water reclamation system creating riparian habitat page, 21-22.

This is the first of an educational series regarding water and waste applications of appropriate technology for San Luis Obispo County. **Appropriate technology** is defined as:

> Applying technology to address problems related to energy use, the water cycle, and affordable building at the smallest and most accessible scale possible.

These guidelines are being developed by the San Luis Obispo Coalition of Appropriate Technology (SLO-COAT) to specifically address efforts to maintain a healthy hydrologic cycle in San Luis Obispo County.

SLO-COAT is a joint effort by SLO Green Build, the San Luis Bay Chapter of the Surfrider Foundation and the Santa Lucia Chapter of the Sierra Club. The information presented is for general education purposes. Final details and construction must be developed and designed for specific site conditions; therefore, SLO-COAT is hereby indemnified from any liability arising from the use of this information.

SIERRA CLUB
SANTA LUCIA CHAPTER

SLO Green Build

Surfrider Foundation

Cover images (clockwise from top left) courtesy of Carmichael Environmental Design/Build, Greg McMillan and San Luis Sustainability Group Architects.

HISTORY

During Jerry Brown's Administration in California from 1972 to 1980, the State Office of Appropriate Technology was developed. OAT as it was called was headed by Sim Van der Ryn, the State Architect at the time. OAT encouraged the application of appropriate technologies to address the economic and environmental concerns of development.

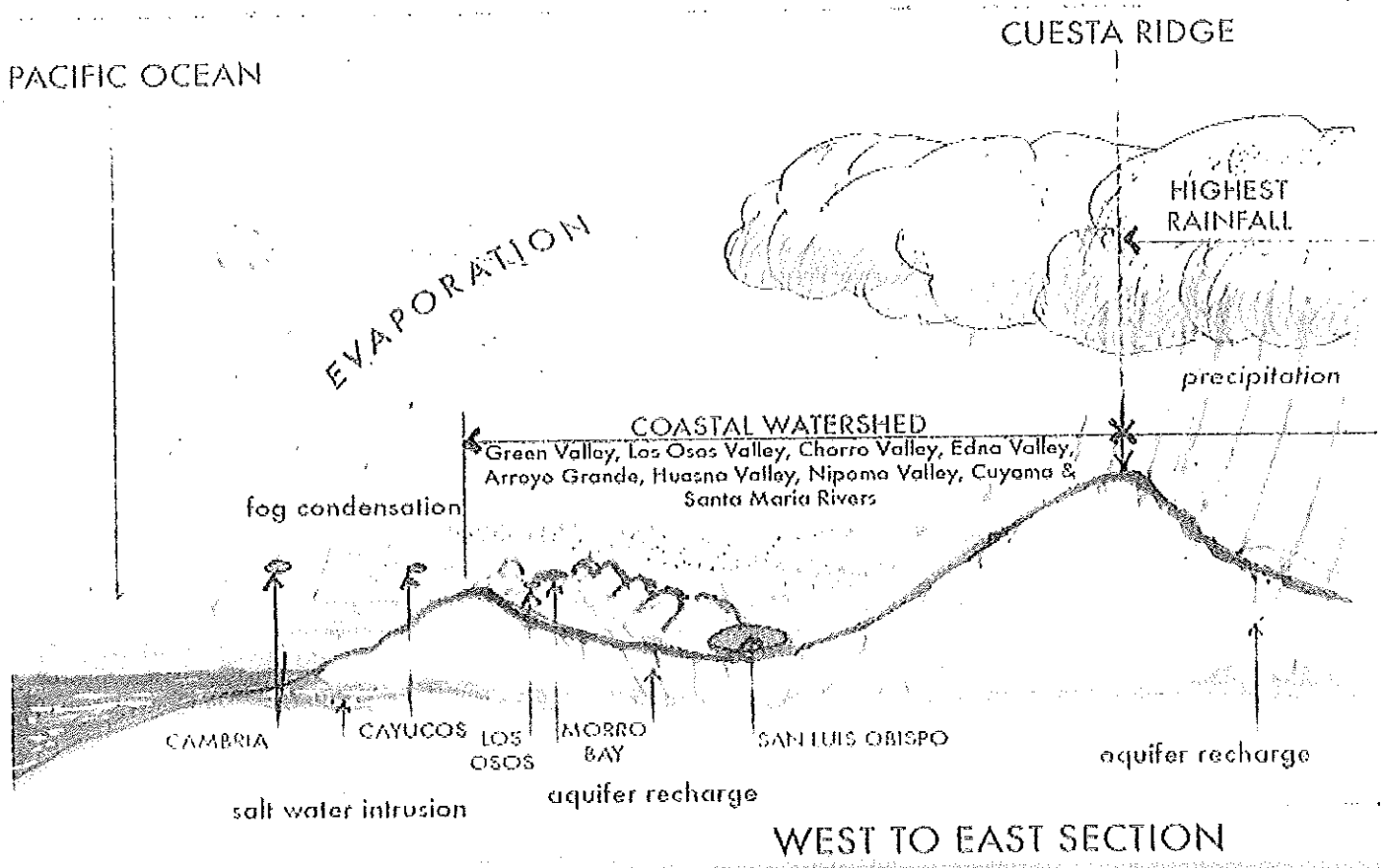
SITUATION

The dismantling of OAT by the next administration in 1980 proved to be short-sighted given the ongoing concerns about energy and the double threat of climate change coupled with peak fossil fuel supply. The water imbalances in San Luis Obispo County have become evident as many municipalities implement water rationing policies. Growth has always been naturally restrained due to scarce water resources in the County, so increased infrastructure costs burden new development. Fortunately, over the past thirty years, the research and refinement of appropriate technologies have much to offer us today.

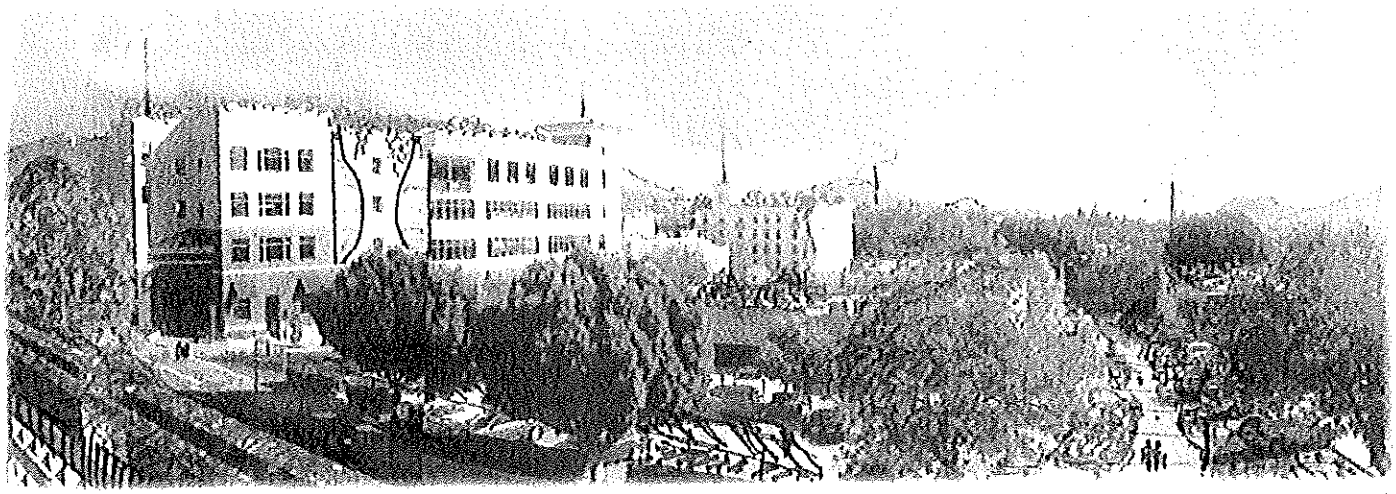
SLO-COAT believes it is imperative that we revisit, at a local scale, the encouragement and application of appropriate technology. San Luis Obispo County is in a position to be at the forefront of these efforts to reconcile growth and environmental quality. This San Luis Obispo Guide to the Use of Graywater was produced to encourage the use of graywater in a safe and legal manner.

Contributing members of SLO-COAT: Ken Haggard-Architect & Planner, Mikel Robertson- General Contractor & Green Building Material Specialist, Rachel Aljilani- LEED AP, Joshua Carmichael- Landscape Designer & Contractor

Special thanks to:
Brad Lancaster, Art Ludwig, Brock Dolman and Johnathan Todd who have helped educate our community on the current trends in appropriate technology applications and regulations. Of course this would not be possible without the support of SLO-COAT members: Mladen Bandov, Andrew Christie, Mary Fullwood, Cheryl Lenhardt, Steve Paige, Scott Peterson, Lawson Schaller, Jessica Steely, Karen Venditti, Sam Studer, and the numerous family and friends who are also concerned about water resources and sustainable development.

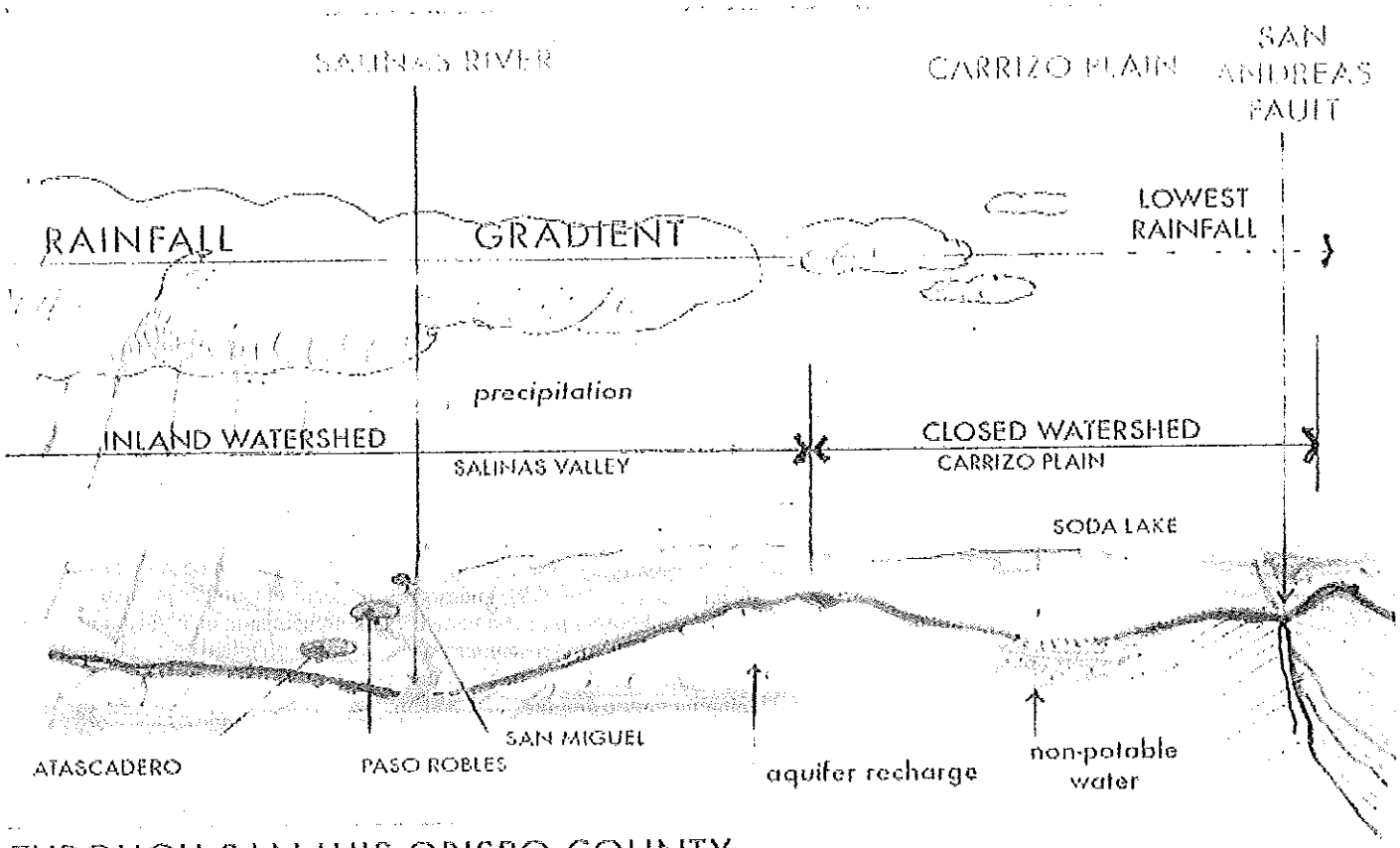


A HEALTHY NATURAL HYDROLOGIC CYCLE



The Greening of San Luis Obispo sketch by Ken Haggard

APPROPRIATE TECHNOLOGY SUPPORTS



THROUGH SAN LUIS OBISPO COUNTY

EXISTS IN SAN LUIS OBISPO COUNTY

A healthy hydrologic cycle provides fresh water in the form of precipitation and condensation. This water is transmitted to riparian systems consisting of rivers and streams which in turn charge underground aquifers. In its natural state, this cycle creates healthy watersheds, prevents erosion, stabilizes salt water intrusion and supports rich ecological systems.

Increased built areas usually accentuate adverse changes to the natural hydrologic cycle; therefore, it becomes of vital necessity for us to mimic the natural hydrologic cycle, using the same processes regarding water movement, filtration, and storage.

Application of appropriate technologies as described in this guide can allow development while still maintaining a healthy hydrologic cycle. In addition to graywater, appropriate technology topics related to a healthy water ecology are:

Low Impact Development
Rainwater Harvesting
Waterless Waste Treatment
Bioremediation Strategies

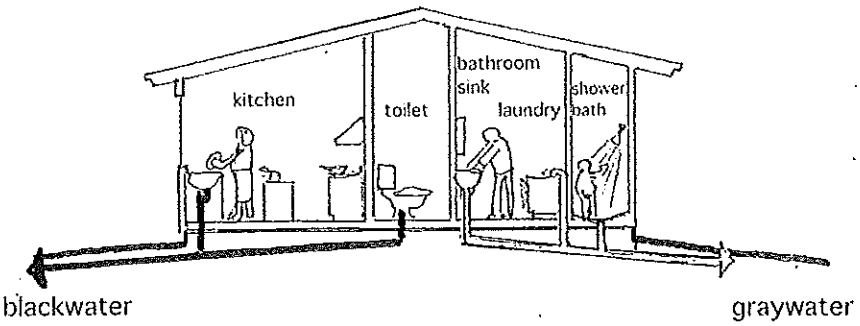
Look forward to more information and educational events presented by SLO-COAT on these topics. If you would like to become involved contact SLO Green Build through the web at www.slogreenbuild.org

GROWTH & A HEALTHY HYDROLOGIC CYCLE

INTRODUCTION

WHAT IS GRAYWATER ?

Graywater is untreated household or building waste water that has not come in contact with toilet or kitchen sink waste. Essentially, graywater is soapy water from washing machines, bathroom sinks, bathtubs, and showers. Graywater should not be stored as it will quickly become foul and turn into blackwater unless treated. Graywater is kept separate from blackwater, which comes from kitchen sinks, dishwashers and toilets. Blackwater is not safe for reuse without more elaborate procedures for treatment & filtration. All graywater systems must be valved to send water to either the graywater distribution area or the sewer/ septic (blackwater) line. Most plumbing combines the wastewater from all fixtures to flow together into either a sewer system or a septic tank. Although



combined wastewater (graywater and blackwater) can be treated and reused, the rigorous standards, system costs and permitting requirements for this type of water recycling are prohibitive for most homeowners. In comparison, a graywater system offers an effective way to reuse your wastewater with minimal cost and effort. The graywater designs presented in this guide can provide you with a better understanding for developing your own graywater system.

IS GRAYWATER LEGAL? ...YES!!!

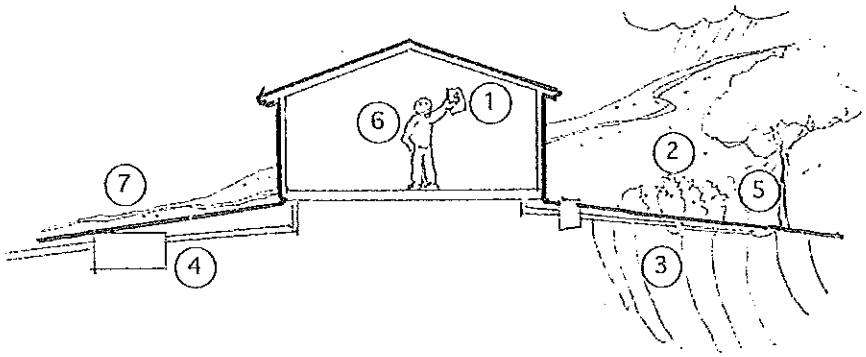
There is an increased demand for water due to population and economic growth. In addition, pollution of and reduction in the water table has adversely affected our once balanced ecosystems, making water an increasingly important and valuable natural resource. Clean potable water is the most valuable type of water, but graywater is useful in meeting our water needs as well. Graywater should not be considered a waste product because it is a valuable resource that can be

WHY IS GRAYWATER SO IMPORTANT?

applied to irrigation and other non-potable water uses. Harvesting graywater to meet your non-potable water demand utilizes an appropriate technology that can recover initial costs quickly. The added benefits to your watershed and community infrastructure make having a graywater system an environmentally friendly solution to scarce water supplies, since more than half of your indoor water can be reused as graywater. It's time to tap into graywater!

POSITIVE IMPACTS OF GRAYWATER SYSTEMS

1. Lower water utility bills for home or business occupants
2. Potential for landscape irrigation
3. Groundwater or aquifer recharge
4. Reduced strain on septic or sewer systems which in turn lower energy loads at central treatment plants
5. Bioremediation strategies can clean water and enhance the local ecology



6. Feel good about conserving a precious resource essential to our lives
7. Preserve potable water sources for future uses

INDEX

This guide has been set-up in a way that allows you to consider options that are appropriate for your specific site conditions and graywater resources, pages 7-10.

Once you choose a graywater system that is right for you, then you can use the recipe cards to determine the components and overall design.

10 Easy Steps to Develop Your Own Graywater System

You can use graywater, it is legal under state regulations. This guide illustrates how to design, permit and maintain your own graywater system as interpreted by the California State Graywater law [ref. 4].

Maintaining and Using Graywater

- ❑ Graywater should be avoided when irrigating edibles in your landscape. [Ref. 9]
- ❑ Avoid planting invasive water loving plants (pampas grass, Arunda donax, scotch broom, etc.).
- ❑ Avoid using graywater in hoses that can be used to wash or play with.
- ❑ Potable and graywater supply pipes should never be connected.
- ❑ Graywater that has come in contact with soiled diapers is blackwater.
- ❑ Corrugated pipes for graywater discharge should be avoided, they slow the flow.
- ❑ Use a subsurface drip system when irrigating lawns.
- ❑ In general, tilling organic matter into soil that comes in contact with graywater is good.

Detergents & Cleaners [ref. 1]

Additional information regarding the composition of detergents can be found in appendix 1- Detergents for Graywater Systems, page 27.

Hand soaps and shampoos by and large do not damage plants or clog soil profiles, in fact graywater is a light fertilizer. Laundry detergents commonly have sodium and boron which are chemicals that can have a negative effect on landscapes. The following are detergents or cleaners to avoid:

- ❑ Bleaches or softeners
- ❑ Detergents that advertise whitening, softening, and enzymatic powers
- ❑ Detergents with the following ingredients: boron, borax, chlorine, bleach, petroleum distillers, sodium and peroxygen
- ❑ Products designed to open clogs without scrubbing
- ❑ Water softeners that use sodium chloride

Plants that Typically Love Graywater [ref. 1]

Oleander, bougainvillea, fan and date palms, rosemary, roses, agapanthus, Bermuda grass, honeysuckle, Australian tea tree, Italian stone, oaks, Arizona cypress, cottonwood, olive, ice plant, juniper, purple hopseed, manzanita, ceanothus, rushes, coffeeberry, toyon, western redbud, california wax myrtel, penstemon.

Plants that Typically Don't Like Graywater [ref. 1]

Rhododendron, bleeding hearts, wood sorrel, hydrangeas, azaleas, violets, impatiens, begonias, ferns, foxgloves, gardenias, philodendron, camellias, primroses, crape mertyle, redwoods, star jasmine, holly and deoder cedar.

For more information on graywater plants, see appendix 2- Plants for Graywater Systems, page 28.

STEP 1: BASELINE CONSERVATION

Before incorporating graywater into your lifestyle, first start off by adopting a baseline conservation plan. Conservation is the most affordable technology and practices are readily available that require little if any behavior change. Most water providers have programs to help you conserve that offer free or discounted low flow shower heads, faucet aerators, toilet tummies and more.

While this document does not attempt to provide a thorough cost benefit analysis, we recognize it is a worthwhile consideration. Cost/benefit will vary greatly depending on the graywater system selected, the local cost of water and the volumes utilized. Some systems are very simple, low cost and can be done by the homeowner with few new parts and supplies, or by integrating salvaged/used materials. Other systems are more complex, requiring professional installation, and expensive components. Regardless of the system selected and the volumes utilized, the user will have the satisfaction and benefit of reusing water, helping the environment, and having a drought resistant supply during mandatory watering restrictions.

Bathrooms

- ☐ Check for leaks from pipes and faucets, the smallest drip can waste up to 2 gallons per day!
- ☐ Install dual-flush or ultra low flow toilets.
- ☐ Install low-flow faucets or faucet aerators.
- ☐ Turn off water while brushing your teeth and shaving.
- ☐ Take 5 minute or shorter showers and turn water off during and while soaping.

Kitchen

- ☐ Scrape rather than rinse dishes before placing them in the dishwasher.
- ☐ Do not thaw frozen food under running water.
- ☐ When hand washing dishes, fill one basin with soapy water and the other with rinse water.
- ☐ Install Energy Star rated dishwasher and only wash full loads.
- ☐ Avoid running water continuously while washing dishes.

Laundry

- ☐ Install Energy Star clothes washer and set water volume to the minimum requirement per load.
- ☐ Use short water cycles for lightly soiled loads.
- ☐ Pre-treat stains to avoid multiple washings.
- ☐ Soak heavily soiled items in a sink one third full to prewash.

STEP 2: CALCULATIONS A- Graywater Flow

Using the number of bedrooms in your residence provides an estimate of the graywater flow for typical households:

Enter the number of bedrooms =

Calculate the number of occupants =
- Start with two (2) occupants for the first bedroom
- Add one (1) occupant for each additional bedroom

Graywater can be estimated as generated from each occupant on a daily basis. Choose from the following list of sources based on your graywater system. Each graywater flow estimate is based per occupant.

Showers, bathtubs, wash basins & clothes washer	40 gallons per day
Showers, bathtubs & wash basins (only)	25 gallons per day
Clothes washer (only)	15 gallons per day

Multiply the number of occupants by the estimated graywater flow in gallons per day (gpd) per occupant to determine the total estimated graywater flow.

Number of occupants	x	Graywater flow per occupant	=	Total estimated graywater flow
	x	gpd	=	gpd

For example, the graywater flow for a four-bedroom main house, which includes all fixtures such as showers, sinks, and clothes washer, and a one-bedroom guest house, which includes only a shower and sink, is estimated :

Main House (4 bedroom):	5 occupants	x	40 gpd per occupant	=	200 gpd
Guest House (1 bedroom):	2 occupants	x	25 gpd per occupant	=	50 gpd
			TOTAL GRAYWATER	=	250 gpd

STEP 2: CALCULATIONS B - Soil Absorption Capacity & Distribution Area

Design the graywater system based on the soil and groundwater conditions of the property. Select an area within the property boundaries to be used for irrigation or disposal of the graywater. The surface and subsurface soil must be suitable to accept the design flow of graywater. The fundamental soil characteristic is the percolation rate, which indicates how fast the soil can absorb water. Soil types like fine sand or sandy loam have better percolation rates than clay, for instance. Better percolation rates mean that less area will be required to adequately disperse all the graywater.

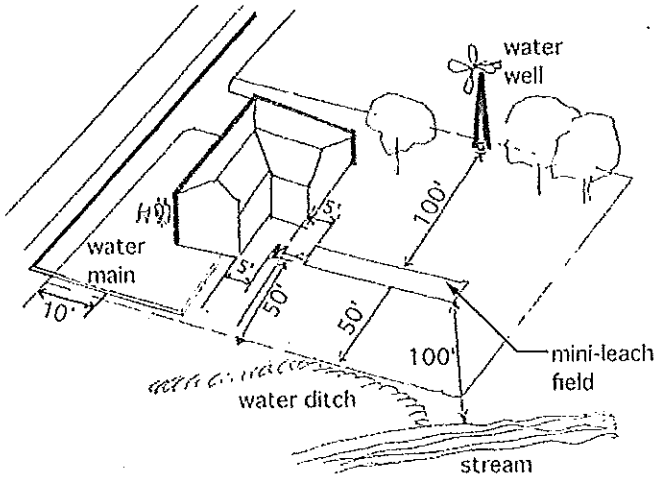
Percolation Rate Table:

Soil Type	Percolation Test Results (min/inch)	Infiltration Type Irrigation (sf/gpd)	18" Wide Mini-Leachfield (linear ft/gpd)	Subsurface Drip System (sf/gpd)
	0 – 4	not allowed - too fast		
Coarse sand or gravel	5 – 11	0.20	0.13	0.82
Fine sand	12 – 17	0.25	0.17	0.95
Sandy loam	18 – 23	0.40	0.27	1.22
Sandy clay	24 – 47	0.60	0.40	1.50
Clay with considerable sand or gravel	48 – 59	0.90	0.60	2.18
Clay with small amount of sand or gravel	60	1.20	0.80	2.72
	61+	not allowed - too slow		

Percolation Test Procedures

Select percolation test locations in the area to be used for graywater disposal. Dig a few test holes (8"-12" diameter) to the same depth as the bottom of the disposal area. Cover the hole bottom with 2" of gravel. Pre-soak holes overnight. During the test, fill the holes at least 8"-10" above the gravel. Using a stake marked at 1/4" intervals, measure the falling water level at 30 minute intervals while re-filling after each measurement. Obtain at least 12 measurements (i.e., a perc test is at least 6 hours long.) The drop during the final 30-minute interval is the calculated percolation rate converted to minutes per inch. For sandy soils where the water level drops faster than 6" in 25 minutes, take 12 measurements every 10 minutes.

STEP 2: CALCULATIONS C - Site Planning [ref. 4]



To locate your existing utility lines for your plot plan, call 811 or visit www.call811.com

Minimum Horizontal Distance From	Surge Tank (feet)	Irrigation Field (feet)
Buildings or structures [1]	5[2]	8[3]
Property line adjoining private property	5	5
Water supply wells [4]	50	100
Streams and lakes [4]	50	50
Seepage pits or cesspools	5	5
Disposal field and 100% expansion area	5	4[5]
Septic tank	0	5[6]
On-site domestic water service line	5	5[7]
Pressure public water main	10	10[8]
Water ditches	50	50

Notes: When mini-leach fields are installed in sloping ground, the minimum horizontal distance between any part of the distribution system and ground surface shall be 15 feet.

[1] Including porches and steps, whether covered or uncovered, but does not include carports, covered walks, driveways and similar structures.

[2] The distance may be reduced to zero feet for aboveground tanks if approved by the Administrative Authority.

[3] The distance may be reduced to two feet, with a water barrier, by the Administrative Authority, upon consideration of the soil expansion index.

[4] Where special hazards are involved, the distance may be increased by the Administrative Authority.

[5] Applies to the mini-leach-field type system only. Plus two feet for each additional foot of depth in excess of one foot below the bottom of the drain line.

[6] Applies to mini-leach-field type system only.

[7] A two foot separation is required for subsurface drip systems.

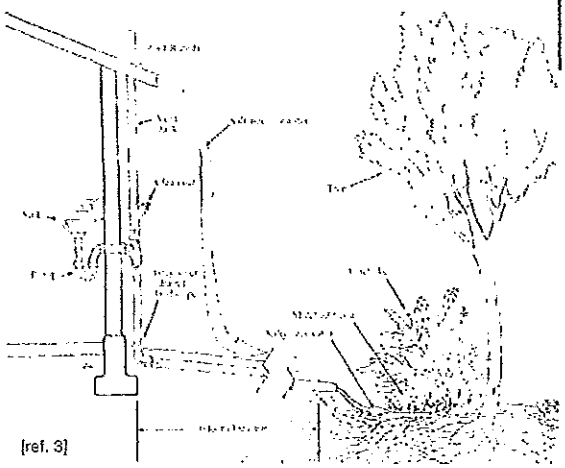
[8] For parallel construction or for crossings, approval by the Administrative Authority shall be required.

[9] Minimum separation from highest known groundwater is five feet.

*Drip systems may allow for a reduction in setbacks.

PARTS OF A GRAYWATER SYSTEM

Collection of Graywater	Provide Surge Capacity	Filtration	Distribution	Using Graywater
Individual plumbing of laundry or shower/ tub or sinks	gravity surge tank	Disk or in-line filter	Gravity fed	***Irrigation and aquifer recharge by***
-or-	*-or-*	*-or-*	*-or-*	Mini leach field
Dual plumbing whole house (especially recommended for new construction)	pumped surge tank	Bag, mesh or fabric filter	Pumped	*-or-*
	-or-	*-or-*	*-or-*	Branched system
	surge capacity in the distribution system (i.e. branched irrigation system)	Gravity sand filter	Siphoned	*-or-*
		-or-		Watering Moat
		Pressurized sand filter		*-or-*
				Field consisting of a drip system
				-or-
				Reed bed
				-or-
				Washing machine sump
				Use in the building (toilet flushing)
				Cistern Mode
				-or-
				commercially available tank
				Aquifer Recharge & septic system relief
				Galley System



[ref. 3]

Salt Build Up - What to do?

Salt builds up in the soils of graywater systems, especially in warmer areas. Salt can be leached out by flushing the system with fresh water. You might be surprised to find out that approximately every 1000 square feet of property can yield 600 gallons of water in a 1 inch rain storm. By directing the flow of our roof's drip lines, gutters, and driveways into the landscape via depressions or basins, instead of mounds, the graywater system is flushed naturally and salt build up does not become a problem.

This page shows the basic components of all graywater systems and some options available to you. Choose the best option for your site, soil type, financial resources and maintenance preferences. Once a system is chosen, you can use the recipe cards for details of construction.

NOTES:

DIAGRAM OF SYSTEM OPTIONS

REFERENCE RECIPE/PAGE CARD #

BASELINE CONSERVATION IS THE PREREQUISITE AND FIRST STEP IN GRAYWATER UTLIZATION.

GRAYWATER SHOULD NOT BE STORED BUT SHOULD BE UTILIZED AS FAST AS YOU CAN PROCESS IT.

ALL GRAYWATER SYSTEMS NEED TO HAVE A VALVE TO SWITCH TO YOUR SEPTIC OR SEWER SYSTEM.

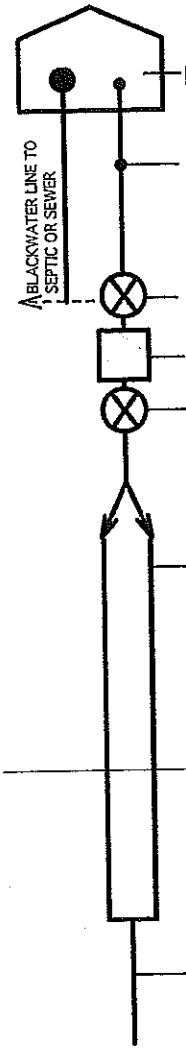
THE SURGE TANK ALLOWS YOU TO TEMPORARILY HOLD GRAYWATER IF THE FLOW EXCEEDS YOUR ABILITY TO UTILIZE IT

DUAL FIELDS ARE USED IN LEACH AREAS FOR IRRIGATION TO GIVE ADEQUATE ABSORPTION TIME TO EACH SIDE. THE FLOW IS CONTROLLED BY A DISTRIBUTION OPTION SHOWN ON PAGE 11.

THE DRIP SYSTEM REQUIRES A PUMPED SURGE TANK TO MINIMIZE CLOGGING.

IN-HOUSE UTILIZATION CAN BE FOR TOILET FLUSHING WITH EXCESS FLOWS TO IRRIGATION SYSTEMS

ALTHOUGH NOT HELPFUL FOR IRRIGATION, A TRADITIONAL LEACH FIELD CAN BE USED TO TAKE SOME LOAD OFF OF A SEWER SYSTEM OR RECHARGE THE LOCAL AQUIFER.



HOUSE WITH BASELINE CONSERVATION — 9

GRAYWATER
- ESTIMATING DISCHARGE — 9
- EVALUATING SOIL CONDITIONS — 10
- SITE STANDARDS & PLANNING — 10

SWITCH VALVE

SURGE TANK & DISTRIBUTION OPTIONS
- A. SURGE TANK OPTIONS — A — 11
- B. DISTRIBUTION OPTIONS — B — 11
- C. BRANCHED SYSTEM (NO SURGE TANK) — C — 12

UTILIZATION OPTIONS
(OTHER THAN THE BRANCHED SYSTEM)

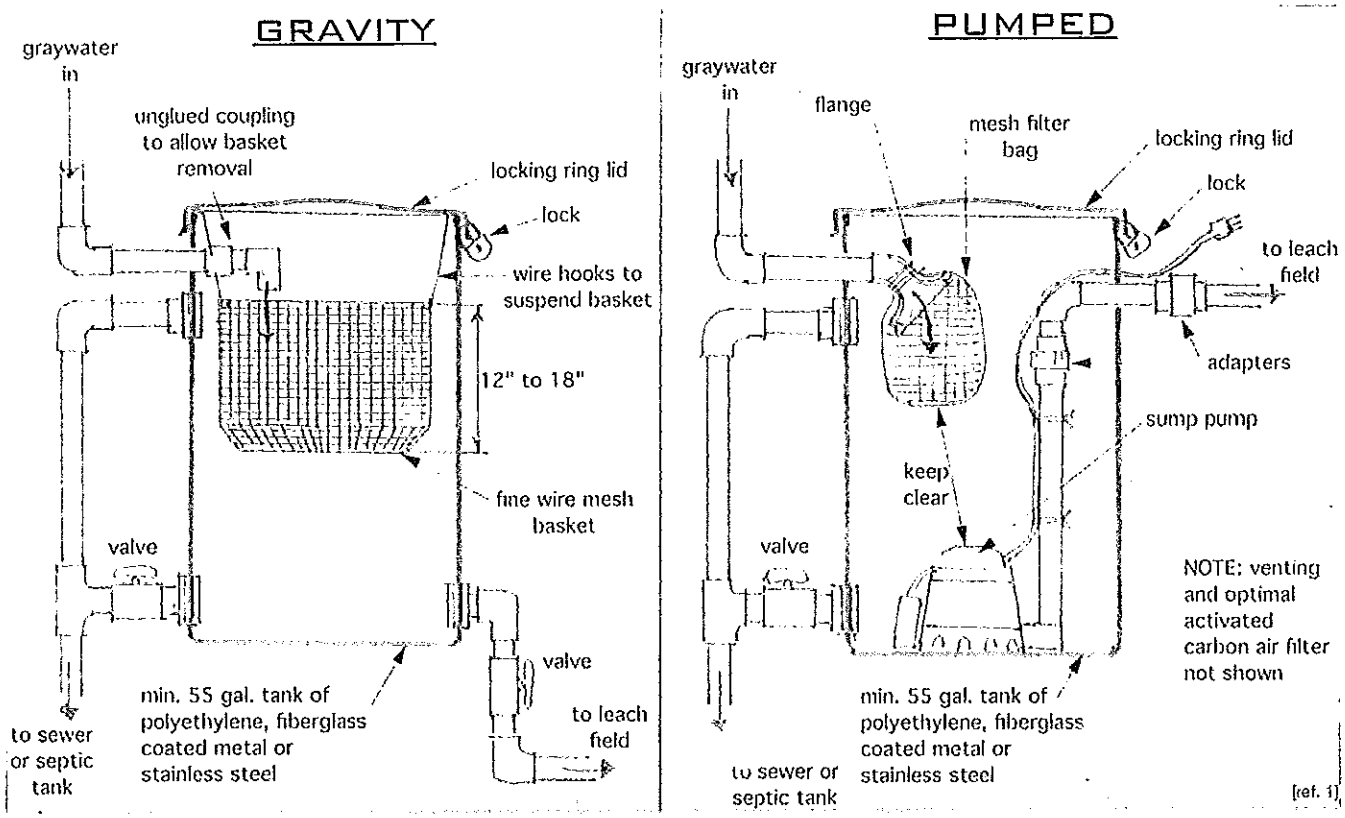
1. LEACH OPTIONS FOR IRRIGATION
- D. FLOWER POT EMITTER — D — 13
- E. MINI-LEACH FIELD — E — 14
- F. VEGETATED LEACH FIELD — F — 15
- G. MULCHED WATERING MOAT — G — 16
- H. TREE WATERING MOAT — H — 17
- I. INFILTRATION GALLEY — I — 18
- J. DRIP SYSTEM FIELD — J — 19-20
- K. REED BEDS — K — 21-22
- L. WASHING MACHINE SUMP — L — 23

2. IN-HOUSE UTILIZATION
- M. GRAYWATER TOILET FLUSHING — M — 24

3. TRADITIONAL LEACH FIELD

New technologies are constantly being refined and improved.

A - SURGE TANK



SURGE CAPACITY

All graywater systems need to be able to handle the peak flows, or surge capacity, from the various plumbing fixtures. For most homes, a surge capacity of 45 gallons is sufficient. For instance, a 10-minute shower could generate 20-50 gallons of graywater at a time. Use the estimated daily flow rates as a guide for the surge capacity needed. If daily water use combines showers, bathing, and laundry all at the same time, the surge capacity should be adjusted accordingly. Graywater systems without sufficient surge capacity will cause pipes to backup.

SURGE TANKS

Surge tanks are the standard solutions for providing surge capacity, usually ranging between 30 to 55 gallons. Specific construction details and requirements including a conceptual diagram are given in the plumbing code. The surge tanks shown in this guide are examples and might not include all the permit requirements such as venting, backwater valves, bracing, labeling, etc. Multiple tanks could be joined together to provide additional surge capacity.

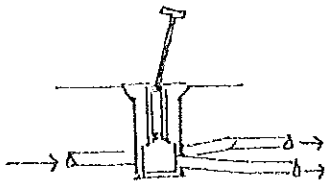
In addition to the inlet and outlet ports, surge tanks also have an emergency drain valve and overflow outlet, which connect to the main sewer line. The overflow outlet should not have a valve and remain permanently open to the main sewer line, while other valves can be operated during cleaning and other maintenance activities.

Surge tanks can be gravity-fed or pump-based distribution as well as have various filter configurations. Inadequate filtration and clogged pumps are two issues with the pump surge tank. Using pumps designed for wastewater such as effluent pumps are expensive but last longer than cheaper well water or sump pumps. Filters should be sized to minimize the change-out/cleaning frequency. Even with the best level of filtration, subsurface drip systems are likely to clog over time, so systems using an automated sand filtration with backwash capabilities fair even better than the prescribed drip system from the plumbing code.

B - DISTRIBUTION OPTIONS

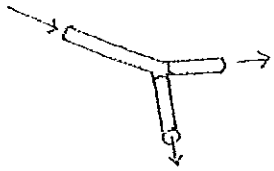
Distribution is automatic in the branched system shown on recipe card C, but with the other absorption systems, distribution must be regulated to a give adequate time to each absorption area. This is done by a distribution box (D-box). A distribution box evenly splits the flow of graywater between absorption areas therefore they should be installed perfectly level on undisturbed ground. Pre-made D-boxes have 4" diameter inlet and outlet pipes with the inlet 1" higher than the outlets. Various options are shown below:

Valve Control



Flow is controlled by a valve which can be operated manually or electrically. Requires attention but does not need to be as level as the other options.

"Y" Outlet

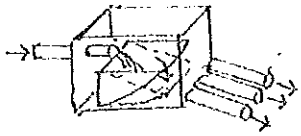


Automatic system for splitting flows equally between 2 absorption areas.

D-Box w/ Multiple Outlets

Automatic system for splitting flow equally between more than 2 areas.

D-Box w/ Dipper Option



This system provides automatic 1.5 gal surge to help prevent the build up of solids. * available commercially as Polylok dipper box.

[ref. 1]

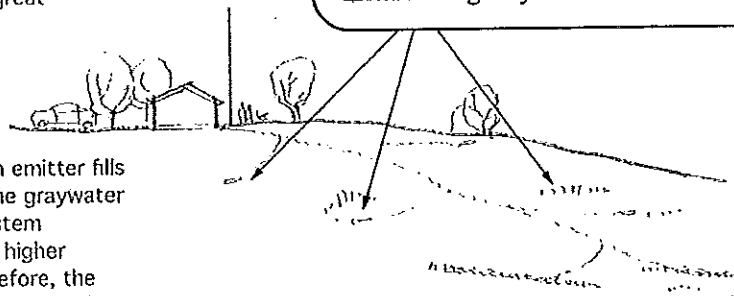
C - BRANCHED SYSTEM

BRANCHED DRAIN SYSTEM

Surge capacity can be provided in the distribution plumbing and the receiving landscape if properly designed. Careful calculations are necessary to ensure that flow splitting and distribution piping function as intended and that piping fittings and slopes are installed properly. Constant slopes, adequately-sized outlets, and precise flow splitting are among the challenges with this approach to providing adequate surge capacity. The Branched Drain System, detailed by Art Ludwig, uses special double ell flow splitters, dipper boxes, and free-flow outlets such as a mulched moat system. Other emitters can also be used provided all the surge capacity is met. This option necessitates a sloped topography where lower elevation areas receive more water and should be planted accordingly.

This is the only system that doesn't require a surge tank since the capacity of the system is great

Various emitters such as the flower pot emitter, tree watering moat, or infiltration galley can be used at terminal ends of the branched system.



As the bottom emitter fills to capacity, the graywater fills up the system activating the higher emitters; therefore, the system must be on a slope.

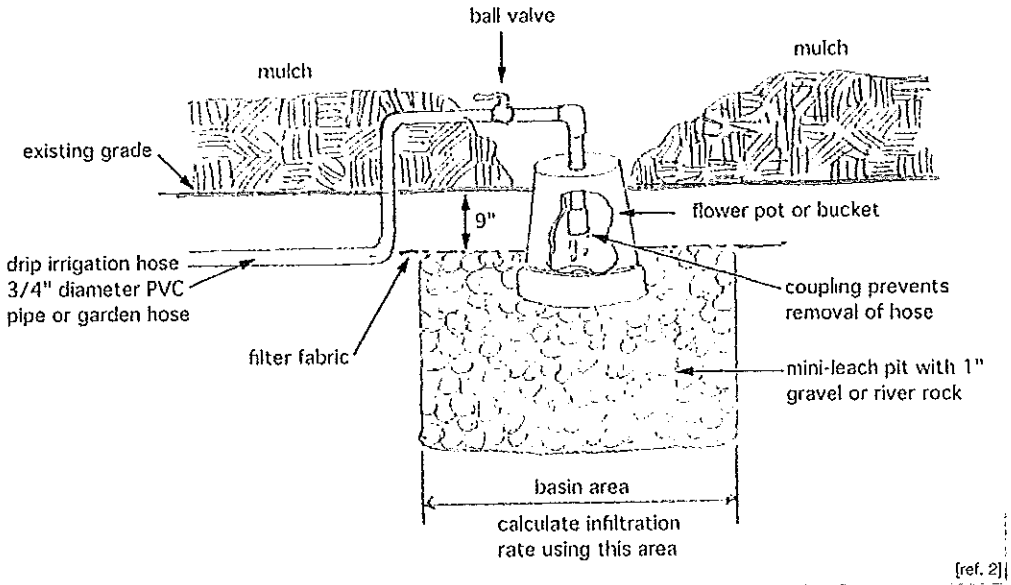
Absorption by the use of mini-leach fields as shown in recipe card E is also possible.

[ref. 2]

THE FOLLOWING RELATIVE RATING GUIDE WILL HELP YOU COMPARE THE VARIOUS UTILIZATION OPTIONS, LOOK FOR THESE IMAGES AT THE TOP OF THE RECIPE CARDS:
LEAST (🌍) TO MOST (🌍🌍🌍) ENVIRONMENTALLY SUSTAINABLE
LOW (🛠) TO HIGH (🛠🛠🛠) COMPLEXITY OF DESIGN, INSTALLATION OR MAINTENANCE
LOW ($) TO HIGH ($$$) COST FOR MATERIALS

D - FLOWER POT EMITTER

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $ $



TECHNOLOGY HIGHLIGHT

- Best suited for small tree or shrub groups with deep roots systems
- Works best with gravity surge tank, pumped surge tank or branched drain system
- Potential beneficial reuse of flower pots, buckets, or similar containers

The flower pot emitter is a passive outlet from the distribution lines after a surge tank (or branched drain system). If each emitter is at the end of a branching pipe, careful flow control is needed to prevent overflowing at any single outlet. Trees and shrubs with deep root system benefit the most from this simple system. Ball valves or other control devices can be used to regulate flow to each emitter.

EXAMPLE OF DESIGN CALCULATIONS

Total graywater flow (4-bedroom house) at	200	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	0.40	gpd per square foot
Required total area (i.e., 200 x 0.40)	80	square feet
Design area for flower pot emitter	9	square feet per emitter
Minimum number of emitters (i.e., 80 ÷ 9)	9	flower pot emitters (rounded up)

INSTALLATION

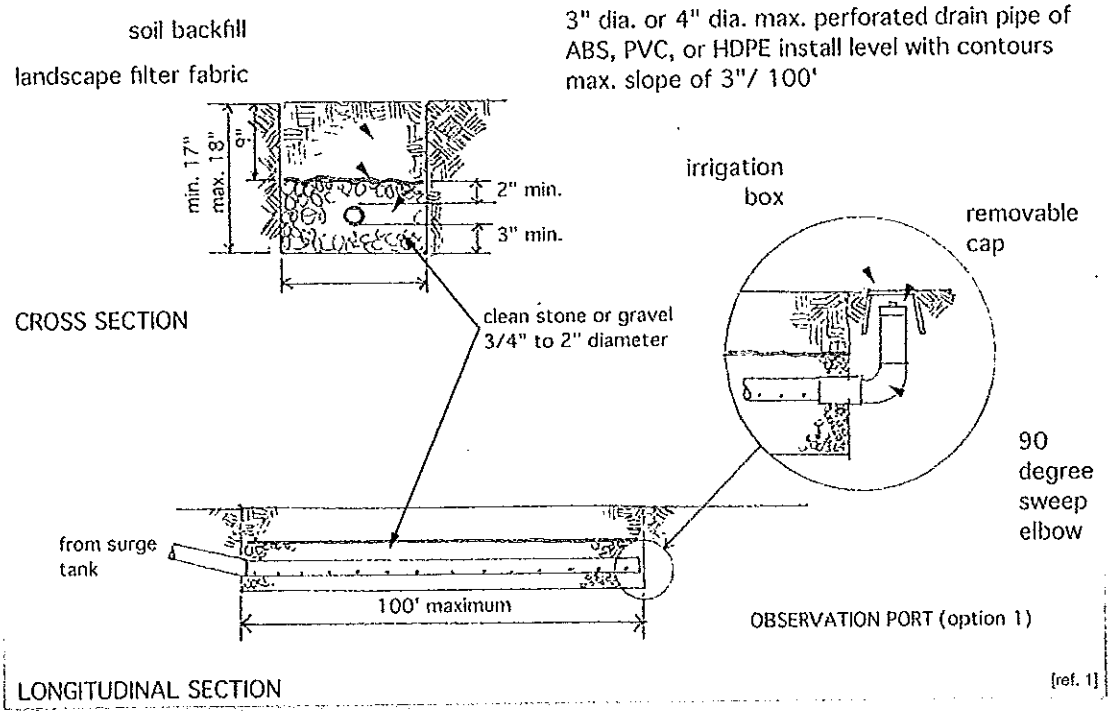
Fill a pit with clean gravel or river rock (minimum 1") at least 1 foot deep and 3 feet on each side. Cover the gravel with filter fabric. Place a flower pot (minimum 5 gallons) upside down on the filter fabric. Use 3/4" PVC pipe and a coupling to secure the pipe inside of the pot. Use a ball valve to help regulate the graywater flow to each emitter. Cover the gravel and filter fabric with mulch or soil at least 9 inches above the bottom of the flower pot.

MAINTENANCE

Clear mulch or soil to expose flower pot, lift up and clean out any clogging material. Replace filter fabric if needed. Flush out pipes and ball valves with clean water when flow is restricted.

E - MINI-LEACH FIELD

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $ $



TECHNOLOGY HIGHLIGHT

- Best suited for straight rows of vegetation
- Works best with filtered gravity surge tank
- Most beneficial for high flows, groundwater recharge or septic tank relief
- Detailed requirements provided in the plumbing code for simplified permitting

The mini-leachfield is a standard design similar to a septic system leachfield with a few differences, including shallower placement. The mini-leachfield has low irrigation efficiency (i.e., most of the water drains away instead of used by the vegetation). Factors such as root intrusion, clogging potential, and the amount of imported gravel or stone overshadow the maintenance and sustainability benefits (compared to other designs.)

EXAMPLE OF DESIGN CALCULATIONS

Total graywater flow (4-bedroom house) at	200	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	0.27	gpd per square foot for standard 18" wide trench
Required total area (i.e., 200 x 0.40)	54	linear feet (18" wide trench)

INSTALLATION

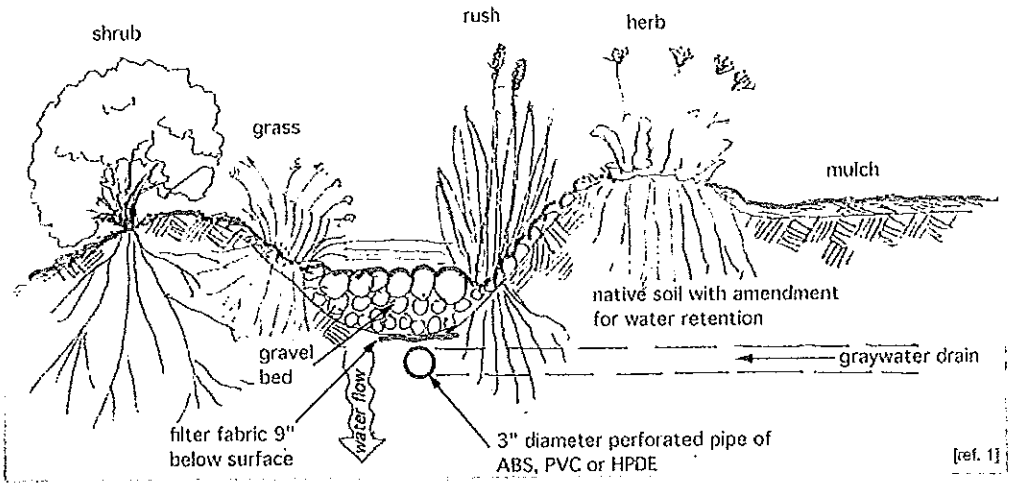
Install valves to allow for switching between irrigation zones. Level each leach field along contours to allow for even distribution, with a maximum slope of 3" per 100'. Use non-corrugated PVC perforated pipe (minimum 3", maximum 4") with holes facing down. Install a 90 degree sweep elbow fitting to the surface with a removable cap as an observation port (optional). Fill a trench (minimum 12", maximum 36" width) with clean stone or gravel at 17" (or 18") below the surface for a 3" (or 4") PVC pipe. Place the PVC pipe on a 3" layer of gravel (3/4" to 2" diameter) with at least a 2" layer over the PVC pipe. Cover the gravel with filter fabric. Backfill with soil to the surface with a 9" minimum cover.

MAINTENANCE

Remove invading roots using the observation ports when needed.

F - VEGETATED LEACH FIELD

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $ $



TECHNOLOGY HIGHLIGHT

- Best suited for larger lots (or long runs) with well-designed landscaping
- Works best with filtered gravity surge tank
- Uses gravel or stone material for an aesthetic dry creek-type feature

The vegetated leachfield is similar to the mini-leachfield using perforated piping to distribute graywater to the surrounding landscape. Native grasses, sedges and shrubs suitable for wetland and drier conditions are located according to root access and proximity to the leachfield pipe. Stormwater flows along the swale during rainy periods to help flush out accumulated salt and sediment.

EXAMPLE OF DESIGN CALCULATIONS

Total graywater flow (4-bedroom house) at	200	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	0.40	gpd per square foot
Required total area (i.e., 200 x 0.40)	80	square feet
Design length for vegetated leachfield	0.5	square feet per linear foot of 6-inch wide trench
Minimum length required (i.e., 80 ÷ 0.5)	160	linear feet of vegetated leachfield Note: maximum single run is 100 feet

INSTALLATION

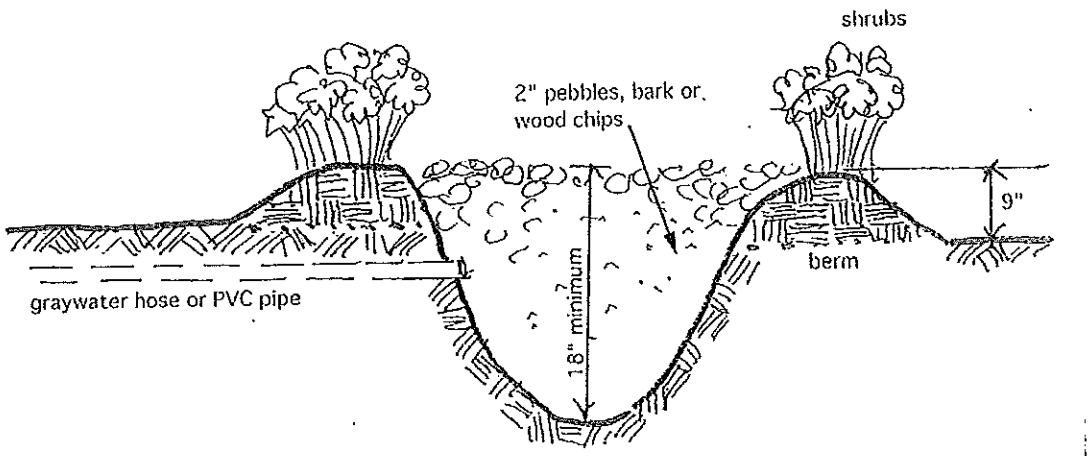
Create a depression (swale) along contour lines in the soil and mounded sides. Lay down a French drain (3" perforated PVC pipe, non-corrugated) in a 6" wide trench at 6" below the swale bottom. Connect pipes from graywater and roof runoff sources at a minimum 2% slope. Cover perforated pipe with filter fabric to prevent clogging. Place amended soil on top of the planting areas. Plant wetland-type plants at the bottom of the swale and upland-type plants along the mounded banks. Cover entire swale with 4" to 6" river rock and gravel mulch, with at least 9" directly over the perforated pipe. Install vault boxes at the ends of the pipe runs.

MAINTENANCE

Regular landscape maintenance and garden upkeep required during the growing seasons. Flush out at seasonal intervals and check for clogging and root intrusion. Most wetland plants get cut to the ground every winter. Trees and shrubs get pruned back as needed. Remove debris collected from vault boxes at the ends of the pipe.

G - MULCHED WATERING MOAT

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $



[ref. 1]

TECHNOLOGY HIGHLIGHT

- Best suited for small flows from single individual plumbing sources
- Works best with filtered gravity surge tank or branched drain system
- Potential beneficial reuse of woods chips, bark, or other mulch material

The mulched watering moat is the simplest passive outlet yet requires regular maintenance to remove and replace decomposed mulch material. Whether plumbed from individual sources or an entire graywater system, each mulched watering moat needs to have well-draining soils (i.e., little or no clay) and sufficient surge capacity to prevent water from surfacing.

EXAMPLE OF DESIGN CALCULATIONS

Total graywater flow (4-bedroom house) at	200	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	0.40	gpd per square foot
Required total area (i.e., 200 x 0.40)	80	square feet
Designed area for mulched watering moat	9	square feet per moat
Minimum number of moats (i.e., 80 ÷ 9)	9	watering moats (rounded up)

INSTALLATION

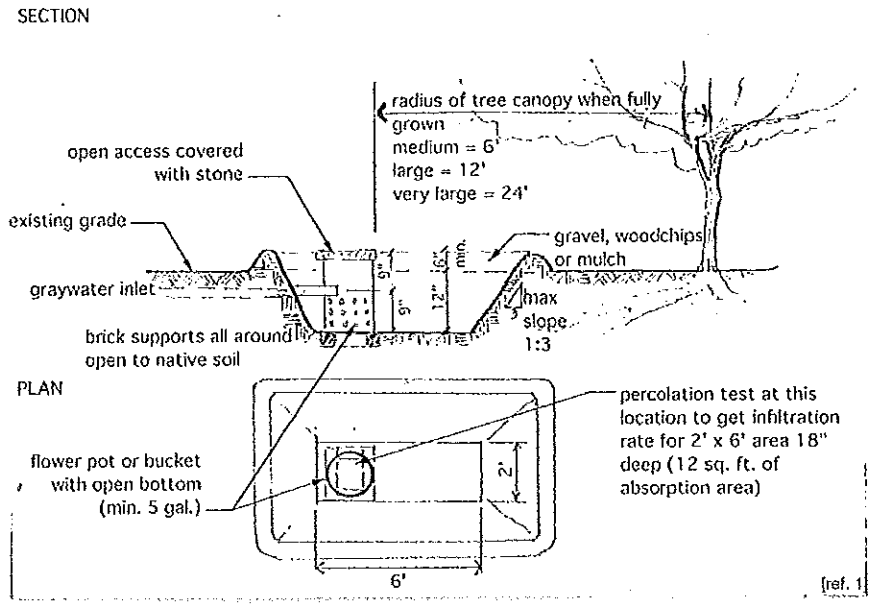
Fill a pit with clean gravel, river rock, bark, or wood chips (minimum 2") 3 feet wide on each side at ground surface. Use soil to create a berm at least 9" above the surface, with a maximum 2:1 slope to the pit bottom. Place 3/4" PVC pipe at least 9" below the ground surface into the moat. Use a screen around the outlet area to keep out pests.

MAINTENANCE

Flush the mulched moats periodically to reduce salt build up. Remove decomposed mulch material and replace with new material as necessary. Check for clogging and root intrusion at the pipe outlet.

H - TREE WATERING MOAT

SUSTAINABILTY: ⊕⊕⊕
COMPLEXITY: 🛠🛠
MATERIALS COST: $ $



TECHNOLOGY HIGHLIGHT

- Best suited for high flow volumes and irrigation of trees and large shrubs
- Works best with gravity surge tank or branched drain system
- Potential beneficial reuse of woods chips, bark, or other mulch material

The tree watering moat is similar to the flower pot design with a larger basin for better percolation. Each tree watering moat needs to have well-draining soils (i.e., little or no clay) and sufficient surge capacity to prevent water from surfacing. Planning the location of the moats requires knowing the tree canopy size (or dripline) at maturity.

EXAMPLE OF DESIGN CALCULATIONS

Total graywater flow (4-bedroom house) at	200	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	0.40	gpd per square foot
Required total area (i.e., 200 x 0.40)	80	square feet
Designed area for tree watering moat	12	square feet per tree watering moat
Minimum number of moats (i.e., 80 ÷ 12)	7	tree watering moats (rounded up)

INSTALLATION

Dig a rectangular pit at 2 feet wide by 6 feet long at least 12" below the natural surface. Slope the sides at a maximum of 3 feet horizontally for each foot vertically and berm up extra soil for an additional 6" above the ground. Place 3/4" PVC pipe at least 9" below the ground surface into the flower pot or bucket emitter (see Flower Pot Emitter profile) with brick supports. Create an open access for bucket emitters covered with a heavy stone for easier maintenance.

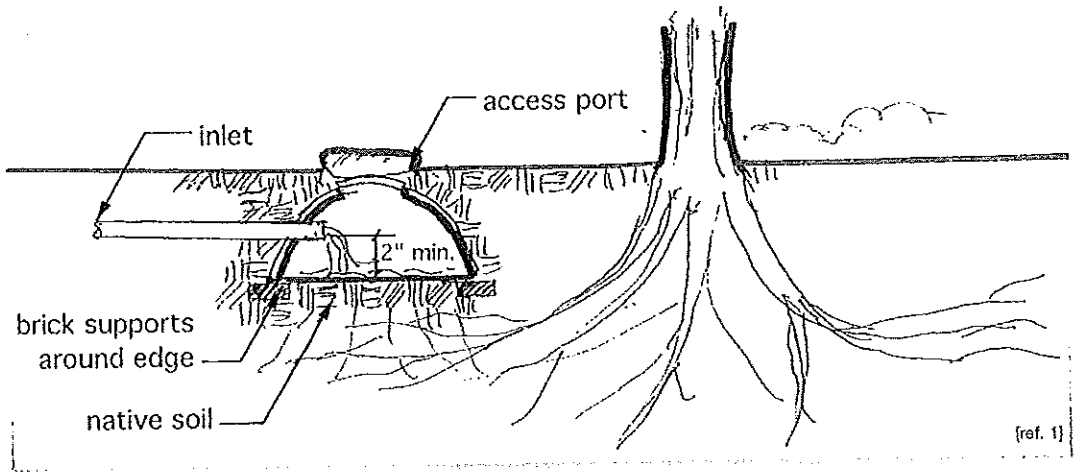
Fill moat with clean gravel, river rock, bark, or wood chips (minimum 2"). Use roadside wood chips, composted municipal waste and recycled aggregate if possible. Locate each tree watering moat between 2/3 times and 1-1/2 times the radius of the tree canopy when fully grown. Use 6' for medium-sized trees, 12' for large trees, and 24' for very large trees. Keep water away from the trunk to avoid root rot.

MAINTENANCE

Flush the tree watering moats periodically to reduce salt build up. Remove decomposed mulch material and replace with new material as necessary. Check the bucket emitter and remove any clogging material as necessary.

I - INFILTRATION GALLEY

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $ $



TECHNOLOGY HIGHLIGHT

- Best suited for high flow volumes and irrigation of trees and large shrubs
- Works best with gravity surge tank, pumped surge tank or branched drain system
- Proven technology with septic systems

The infiltration galley uses half-cylinder structures, such as manufactured infiltrators, barrels cut in half, or large diameter pipes, to create a large void space beneath the soil. The large capacity also allows for more surge volume for each galley. Manufactured infiltrators can be linked together to reduce piping. Design and install prefab infiltrators according to the manufacturer instructions.

EXAMPLE OF DESIGN CALCULATIONS

Total graywater flow (4-bedroom house) at	200	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	0.40	gpd per square foot
Required total area (i.e., 200 x 0.40)	80	square feet
Typical infiltrator disposal area (for example, 75" long x 34" wide x 12" deep)	17	square feet per infiltrator
Minimum number of infiltrators (i.e., 80 ÷ 17)	5	infiltrators (rounded up)

INSTALLATION

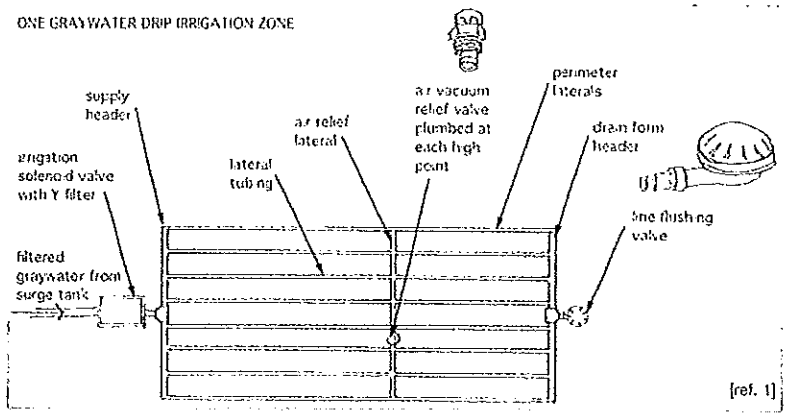
Prefab infiltrator galleys should be installed according to the manufacturer instructions. Modify access ports and observation ports with stone markers for easier maintenance (optional). Alternative infiltration galleys include plastic 55-gallon drums cut lengthwise, large diameter plastic pipes cut lengthwise, and constructed box troughs; Construct with splash blocks, brick or mesh fabric supports (to keep galleys from sinking into the soil), and removable lids, if possible. Cover the galley with soil at least 9" from the bottom of the galley. Locate similarly to tree watering moat for tree irrigation (and away from tree trunks to prevent root rot.)

MAINTENANCE

Check access ports (if available) for any clogging material and remove as necessary.

J - DRIP SYSTEM

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $ $ $



TECHNOLOGY HIGHLIGHT

- Best suited for lawns, clay soils, and sloped sites
- Works best with filtered pumped surge tank
- Standard (prescribed) technology for graywater

A subsurface drip irrigation system is complex and also has the greatest potential for system failure. The drip system requires a well-maintained filter and a properly sized pumping system to prevent clogging. Further details on required equipment and materials are given in the plumbing code. Drip irrigation systems require at least 11 psi operating pressure, and generally include filters, tubing, valves, drip emitters, and controllers. Despite costs and maintenance, drip systems are highly efficient at irrigation, spreading the graywater over the largest possible area with the greatest control.

EXAMPLE OF DESIGN CALCULATIONS

Total graywater flow (4-bedroom house) at	200	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	1.22	gpd per square foot
Required total area (i.e., 200 x 1.22)	244	square feet (sf)
Emitter spacing, using 14" spacing in all directions	1.36	square feet per emitter
Minimum number of emitters (i.e., 244 ÷ 1.36)	180	emitters (spacing at 14" in all directions)

Note: Further drip system design is required to ensure that the pump cycling meets the graywater flow rate.

INSTALLATION

Follow manufacturers instructions for installation of subsurface drip system equipment, including pre-filters, filters, pumps, drip tubing, and emitters. Pre-filters are an initial filter required to catch most of the lint, hair and particles found in graywater. This filter should be easily accessible for cleaning and replacement. They are commonly located at the inlet pipe in the surge tank. The surface area of the filter should be at least 2 square feet. Material can be PVC, polyethylene, woven mesh bag or paper canister filter.

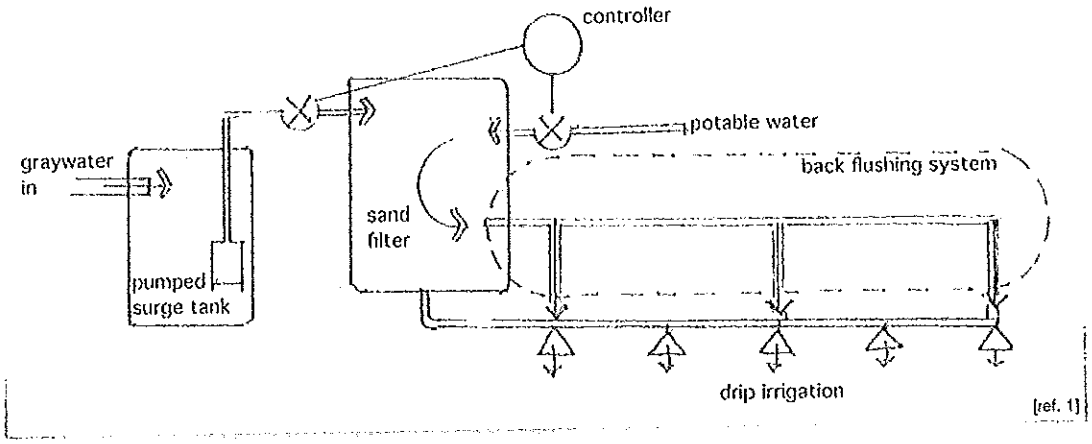
Pump options available include a sump pump, a centrifugal pump or submersible high head effluent pump. Use pressure regulators to maintain the pressure below 25 psi, where most fittings must be kept to prevent damage. Multiple drip system zones are useful to reduce the pump size and provide better operations. Zoned assemblies have a limited number of running feet to maintain the necessary pressure. Stagger drip lines between 12-14" apart so that emitters alternate from row to row. Use manual ball valves or actuated diverter valves to help distribute the flow.

MAINTENANCE

Check and clean all filters routinely. Flush system with clean water or slightly acidic solution several times a year at the beginning of each watering season. Check flushing valve periodically for sediments. Flush the Y-filter monthly. Check tubing for rodents, digging and other abrasion damage where surfaced tubing is visible.

J - DRIP SYSTEM WITH PRESSURIZED SAND FILTER OPTION

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $ $ $



TECHNOLOGY HIGHLIGHT

- Best suited for lawns, clay soils, and sloped sites
- Automated system with minimal maintenance or owner intervention
- Developed proprietary system with high rate of operational success

A subsurface drip irrigation system with pressurized sand filtration and automatic backflushing may be one of the best approaches for challenging projects. Drip systems with pressurized sand filtration require little maintenance compared to regular filter cleaning in surge tanks. The high degree of filtration (similar to swimming pool filtration) provides longer life of pumping equipment, drip lines, and emitters. Although relatively expensive and complex, this system achieves efficient irrigation with low maintenance.

EXAMPLE OF DESIGN CALCULATIONS

Total graywater flow (4-bedroom house) at	200	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	1.22	gpd per square foot
Required total area (i.e., 200 x 1.22)	244	square feet (sf)
Emitter spacing, using 14" spacing in all directions	1.36	square feet per emitter
Minimum number of emitters (i.e., 244 ÷ 1.36)	180	emitters (spacing at 14" in all directions)

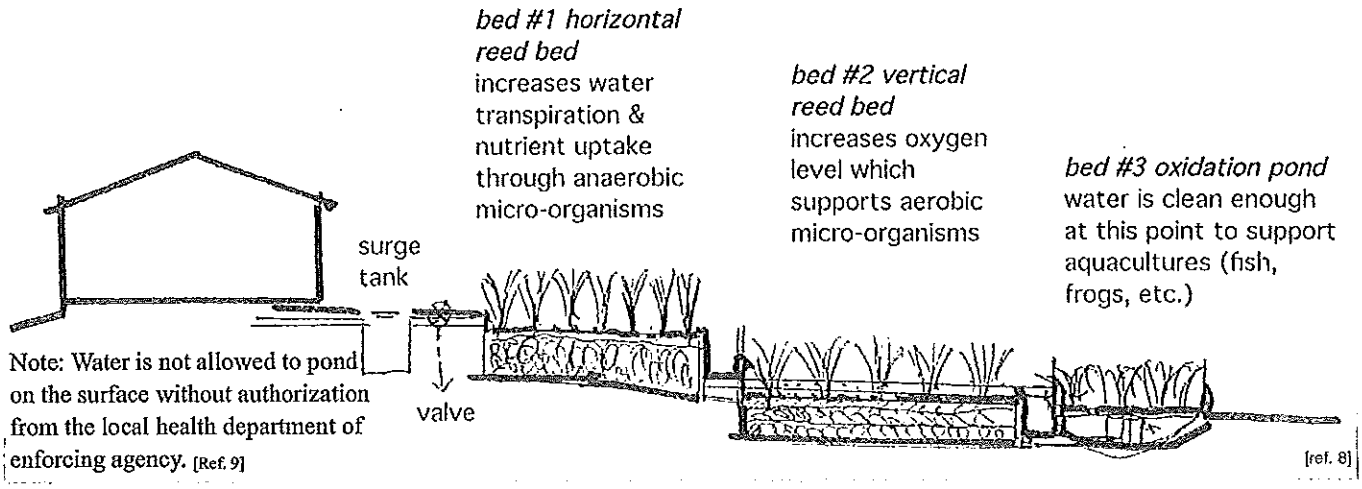
Note: Further drip system design is required to ensure that the pump cycling meets the graywater flow rate.

INSTALLATION & MAINTENANCE

The drip irrigation system with pressurized sand filtration is similar to the basic drip system, using a automatic sand filter vessel under pressure, automated backflushing with potable water, and special emitter cones (instead of in-line emitters). Follow the manufacturer instructions (provided by ReWater Systems). Anticipated maintenance includes checking yearly and, as needed, replacing the sand filter media.

K - REED BEDS

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $ $ $



TECHNOLOGY HIGHLIGHT

- Best suited for large areas with slow percolation rates
- Provides graywater treatment mimicking natural ecological systems
- Allows for better controlled plant growth and possible cultivation

Reed Beds, also known as constructed wetlands, are man made, engineered, marsh like area designed and constructed to treat wastewater. Wetlands are cost-effective, ecological systems, and simple to both install and operate. Reed bed systems are best when soil percolation is very low, space is limited and there is a need to treat large volumes of water. Reed beds provide a home for bacteria, fungus and microbes that digest effluent while deterring flow and retaining suspended solids. Reed beds can be designed as either horizontal or vertical. Horizontal reed beds allow water to enter one side of the bed and flow slowly across and through bed until reaching outlet on opposite side, which then flows into another bed or percolates into the soil.

Reed beds do not have much popularity in this country, thus partnerships and communication with the building department will be helpful. Vertical reed beds allow water to be evenly dispersed along the top of the soil profile. The water slowly percolates through a sandy, rock soil profile until it exits from below or simply percolates into the soil.

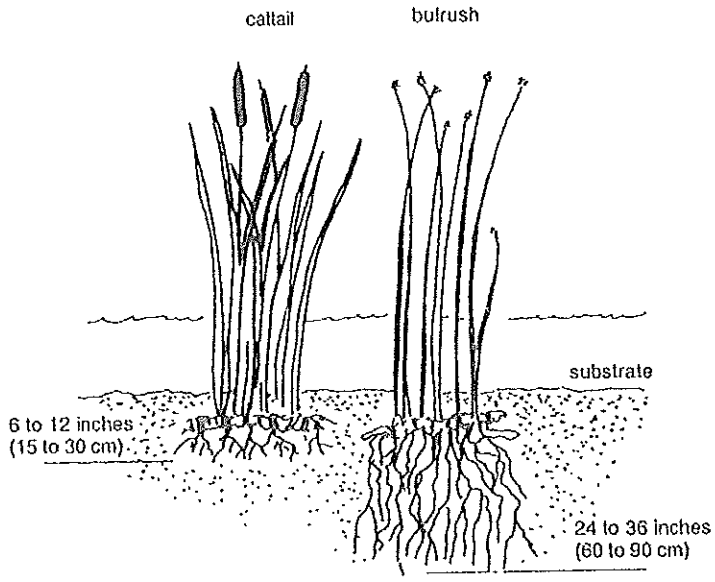
Reed beds provide an ecologically based filtration of wastewater while providing higher biodiversity and beauty. Reed beds when mature host various species of plants, homes to butterflies, dragonflies and other important species. Plants can be harvested for textile and building purposes. In dry areas reed beds provide a contrast to otherwise arid lands.

INSTALLATION

Reed bed construction requires further research for proper design. Plant native species, such as members of the Cyperacae, Junacaece and Typhaceae families. Aquatic plant species should also be selected based on the following criteria: rapid and relatively constant growth rate, ease of propagation, capacity of absorption of pollutants, ease of harvesting, potential for usefulness of harvested material, high oxygen transport ability, tolerance to adverse climate conditions and resistance to pests and disease. Do not plant invasive species.

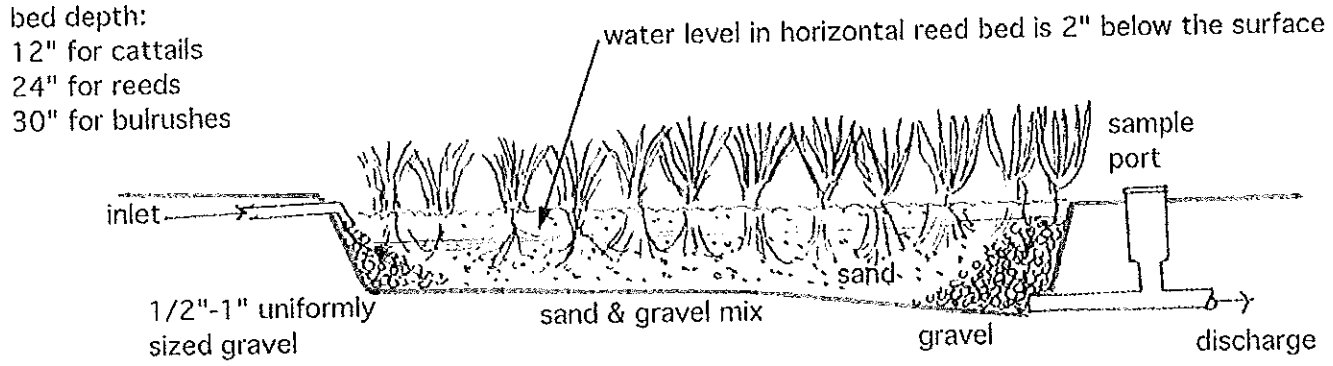
Reed beds require a combination of vertical and horizontal reed beds. Horizontal beds increase water transpiration and nutrient, nitrogen and phosphorous, uptake through anaerobic micro organisms. Vertical reed beds increase the presence of oxygen which host aerobic micro organisms. All reed beds should have overflow zones for storm water conditions. After passing through the beds, install a pond supporting aqua-cultures for fish, frogs, and other ecology.

K - REED BEDS

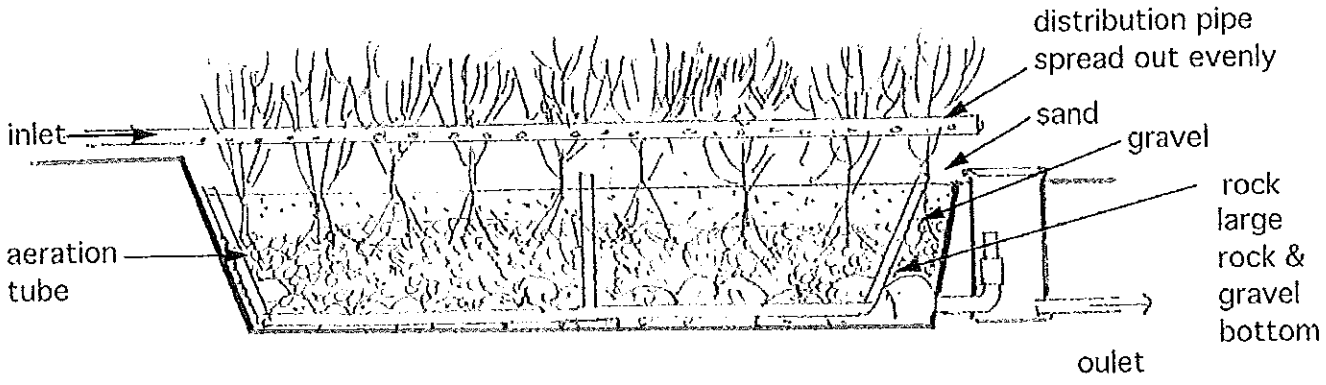


Typical rooting depth - cattail and bulrush [ref. 8]

Note: Water is not allowed to pond on the surface without authorization from the local health department of enforcing agency. [Ref. 9]



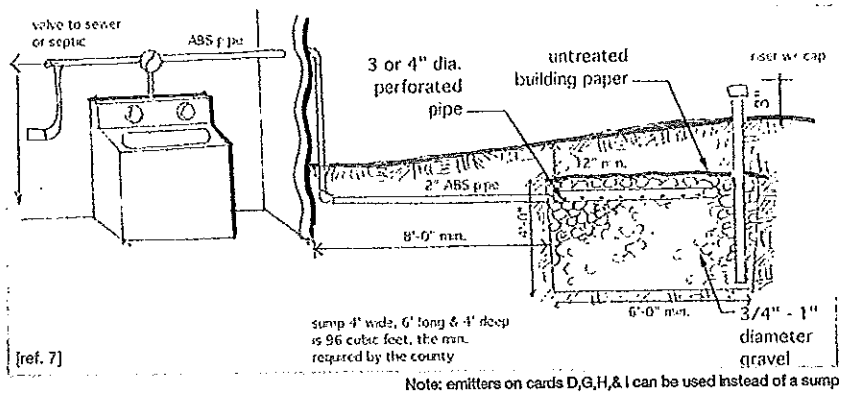
HORIZONTAL REED BED



VERTICAL REED BED

L - WASHING MACHINE SUMP

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $



Note: emitters on cards D,G,H,& I can be used instead of a sump

TECHNOLOGY HIGHLIGHT

- Best suited for all projects, especially remodels and existing construction with slab foundations
- Minimal material and equipment saves on costs
- Basic system design allows for easy installation for most owners

The washing machine sump, also know as a drumless laundry system, is a simple design suitable for all houses with a standard washing machine. San Luis Obispo County permits this system as an alternative to a full dual-plumbed system. Most washing machines are located on exterior walls with access already. Alternative designs may include adaptability to various distribution and irrigation options, such as the flower pot emitter. Be careful to ensure that the pressurized surge capacity is included in design.

EXAMPLE OF DESIGN CALCULATIONS

Washing machine flow (4-bedroom house) at	75	gallons per day (gpd)
Sandy loam soil (see Percolation Rate Table) at	0.40	gpd per square foot
Required total area (i.e., 75 x 0.40)	30	square feet

Continue with design calculations for selected irrigation option, such as the mini-leachfield, flower pot emitter, mulched watering moat, SLO County sump permit, etc.

Note: San Luis Obispo County permits require that the sumps have a minimum volume of 96 cubic feet. For more information, please visit http://www.slocounty.ca.gov/planning/building/Building_details_info/septic.htm

INSTALLATION

Material List: 1" brass three-way, 1" PVC pipe and fittings, check valve or "auto vent" used for air gap, swing check valve (if yard is higher than washer), 1" HDPE (black polyethylene plastic) tubing and barbed fittings, and 1" and 1/2" ball valves

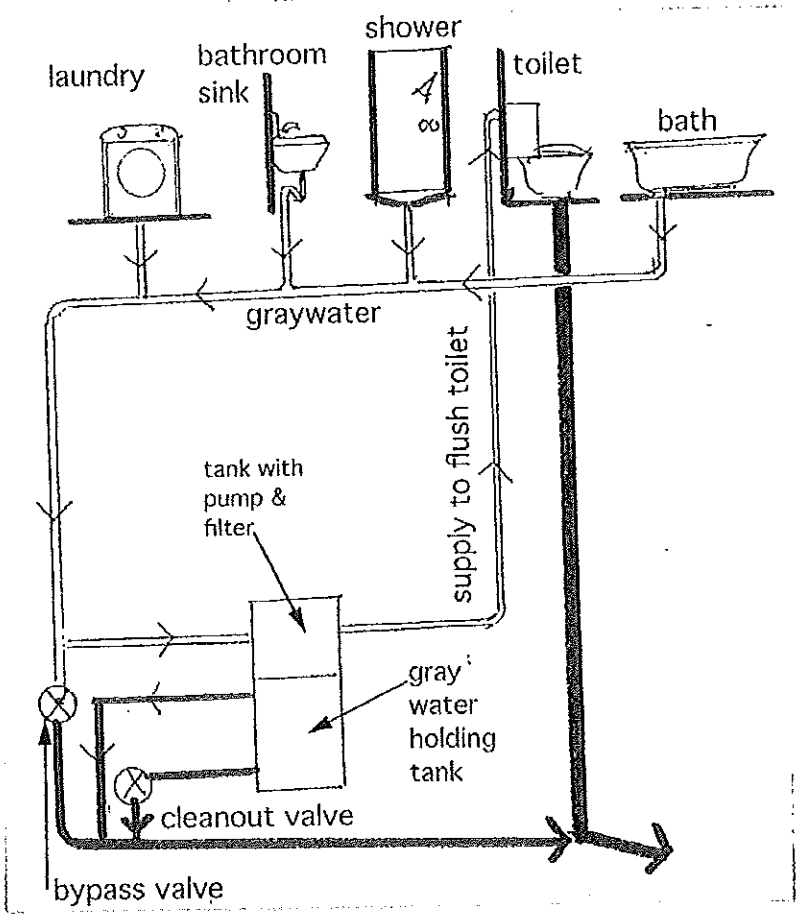
The washing machine's internal pump pressurizes the graywater, so system can irrigate plants that are slightly uphill or further away along flat ground. Do not over stress the washing machine pump, which could require costly repairs. The washer hose is connected to a 3-way valve that can divert graywater either to the sewer or the graywater system. Use 1" rigid HDPE pipe to connect to the outside pipe. Split the flow using barbed Tee fittings to allow graywater to spread out to several freefall locations, such as the flower pot emitters, tree moats, or mulch basin. Drip irrigation will overburden the washing machine and most likely burn out the pump.

MAINTENANCE

Check irrigation emitters for clogging, especially lint material. Lint filters are available specifically for washing machines if lint becomes a problem. Ensure that the piping fiction and emitter elevations are not adding unnecessary friction resistance. Every 50 feet of run adds about as much resistance as 10" vertically. For example, a system that sends water through 100 feet of 1" pipe that ends up 12" lower in elevation than the lid is equivalent to pumping 8" above the lid of the washer (20" – 12" = 8").

M - IN HOUSE USE OF GRAYWATER

SUSTAINABILTY:
COMPLEXITY:
MATERIALS COST: $ $ $



TECHNOLOGY HIGHLIGHT

- Paired with irrigation reuse, indoor reuse systems can significantly reduce potable water use
- Mainly used for toilet flushing
- Proprietary systems are readily available and easy to install

Indoor reuse of graywater systems are primarily designed to treat and reuse graywater for toilet flushing. Some systems collect all the graywater (such as in a dual-plumbed house), provide treatment at a central location, and redistribute the treated stream to all the toilets. Other systems provide a direct connection from the adjacent sink and either treat and temporarily store the graywater for later flushing or allow the graywater water to be fill up the toilet tank immediately prior to flushing. Providing finer filtration coupled with chemical, UV or ozone disinfection allows longer storage time with graywater for toilet reuse. While most indoor reuse have been for commercial projects, residential systems are becoming more popular. [Ref. 9]

Most systems for indoor reuse are complex and expensive, compared to the basic systems used for irrigation, but may have greater environmental impact. Highly treated graywater that meets a certain purification standard in Canada, for example, is allowed for some non-potable uses, such as showers and swimming pools. Units are available for single family, shared central system located at co-housing or apartments.

DESIGN, INSTALLATION & MAINTENANCE

Design, installation and maintenance of indoor reuse systems vary by manufacturer. Most systems are purchased through a vendor and installed by a professional licensed plumber. Some systems requires a minimum storage tank, where similar installation requirements with a surge tank may apply. Maintenance may require filter cleaning, handling of chemicals, and checking for clogging. For example, the Brac system consists of a pump, filter, and holding tank. The Pontos AquaCycle system includes aeration, disinfection, and filtration as well.

GRAYWATER CHECKLIST

Planning

- ☐ Estimate graywater flow (page 7)
- ☐ Estimate graywater absorption area based on soil type or percolation test results (page 8)
- ☐ Estimate distribution area for absorption
- ☐ Plot plan to scale showing
    - o Lot lines, structures, and slopes of surfaces
    - o Location of drainage channels, supply lines, wells
    - o Location of sewage disposal system if applicable, plus 100% expansion area
    - o Location of graywater system consistent with standards on page 8

Surge tank (unless using a branched system)

- ☐ Anchored on dry level compacted soil or on a 3" concrete slab
- ☐ Capacity permanently marked on the tank
- ☐ "Graywater system – irrigation – danger unsafe water" permanently marked on tank
- ☐ Drain & overflow permanently connected to sewer or tank system
- ☐ Test surge tank to ensure it is water tight when filled

Utilization system of your choice

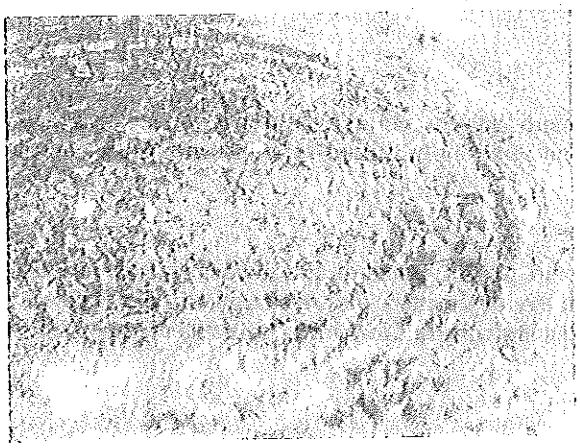
- ☐ Insure that installation conforms to the plot plan
- ☐ Develop a maintenance manual and operating log

SUMMARY

The demand for potable water is increasing and at the same time, climate change is making the consistency of water supplies less predictable. The effect is an increase in demand for imported water from distant sources which is associated with energy intensive and ecologically disruptive processes. The alternative to importing water usually means increased pressure on the local aquifer resulting in aquifer depletion.

This challenging situation forces us to produce and use water carefully. Reduce, reuse and recycle are concepts applied to consumer products; water should be thought of as one of these products, most importantly, it is the one product we must consume to survive. Graywater utilization is an important part of this effort to reduce, reuse and recycle water. Healthy and sustainable communities of the future will use graywater for all non-potable water uses such as irrigation and toilet flushing. Innovators today include REEF, well known for their contribution to the surfing industry, REEF's global headquarters in Carlsbad, CA, uses reclaimed water for irrigation and graywater for toilet flushing. Despite the fact that REEF doesn't own their building, they were able to integrate appropriate technologies yielding cost savings of $200 per month on utility bills and lots of water saved for the future! [5]

In 2008, 20% of the electricity consumed in California was used to move and pump water. On-site harvesting and treatment of water can greatly reduce the amount of electricity used for this purpose. Graywater is but one appropriate technology that will enable us to meet the resource demands of today.



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APPENDIX 1- DETERGENTS FOR GRAYWATER SYSTEMS

When looking for appropriate detergents, read the following information regarding the contents.

Is Biodegradable Better?
The word biodegradable means that a complex chemical is broken down into simpler components through biological action. Do not be confused by the word biodegradable, which is often used to imply environmentally safe. Harmful chemicals as well as beneficial ones may be biodegradable.

A Note About Chlorides
Although chlorine in bleach and detergents is generally expended in the washing process, some may be left in the graywater that reaches plants. Chlorine should not be used in the garden because it may substitute for similar nutrients, blocking normal metabolic processes. The addition of chlorine to water used for irrigation should be kept to a minimum. Choose your detergents and clothes-washing products keeping in mind that it is better for your plants and soils to have a low alkalinity, boron, conductivity, and sodium content in the water. Personal preference may affect your choice of products since higher levels of these constituents may add to their cleansing ability.

Alkalinity
Alkalinity refers to the relative amounts of alkaline chemicals in a solution. Sodium, potassium, and calcium are alkaline chemicals; they often are combined with carbonates, sulfates, or chlorides. Plants do not tolerate high concentrations of alkali salts.

Boron
Boron is considered a plant micro-nutrient required in only very, very small amounts. Most soils provide adequate amounts of this chemical. Concentrations only slightly higher than those considered beneficial can cause severe injury or death to plants!

Conductivity
Conductivity is a simple measure of the amount of dissolved chemicals in a solution. These chemicals can be beneficial or harmful. The higher the conductivity, the more dissolved salts and minerals are present. In general, the higher the concentration of dissolved salts and minerals in the water, the greater the potential for adverse affects on the environment and plant health.

Sodium
Sodium can act as a plant poison by reducing the plants ability to take up water from the soil. Too much sodium can destroy the structure of clay soils, making them slick and greasy by removing air spaces and thus preventing good drainage. Once a clay soil is damaged by sodium, it can be very difficult to restore it to a viable condition.

Phosphate
Phosphate is a plant food and is added to soil as a fertilizer. Soils in the San Luis Obispo area are typically low in phosphates; thus, there may be some benefit to plants if phosphate is present in graywater. However, this may be inaccurate since many forms of phosphate are not readily usable by plants and soils.

Some recommended products are:

Alfa Kleen
Bold
Oasis
Bio Pac
Cheer Free
Ecocover
Shaklee Basic L
Sun Ultra
White King
Yes

APPENDIX 2 - PLANTS FOR GRAYWATER SYSTEMS

Plant List - some recommended species by hydrozone:

Wetland Type—reeds, rushes, & sedges

Carex sp.—Sedge species—C. tumilicola, C. spissa, C. Praegracilis, etc.
Juncus sp.—Rush species—J. patens, J. effusus
Equisetum sp.—Horsetail species—E. hyemale (plant in container to keep from spreading)
Canna sp.—Canna species—Hybrid colors (plant in container to keep from spreading)
*Chondropetalum elephantium—Cape Rush

Upland Type—herbs, shrubs, & trees

Arbutus 'Marina'—Strawberry Madrone Tree
Cercis occidentalis—Western Redbud
Myrica californica—California Wax Myrtle
Rhamnus californica—Coffeeberry
Heteromeles arbutifolia—Toyon
*Rosmarianus officinalis—Rosemary
Artiplex sp.—Salt Bush species
Arctostaphylos sp.—Manzanita species
Ceanothus sp.—California Lilac species
Salvia sp.—Sage species—S. spathacea, S. 'Pt. Sal', S. elegans
Penstemon sp.—Penstemon species—P. heterophyllus, P. digitalis
Achillea sp.—Yarrow species
*Lavandula sp.—Lavender species
*Fragaria chiloensis—Beach Strawberry

Grasses—used in both planting groups

Mulhenbergia rigens—Deergrass
Festuca sp.—Fescue species—Blue Fescue, California Fescue
Calamagrostis sp.—Reed Grass species—C. 'Karl Foerster', C. 'Overdam'
Seslaria sp.—Moor Grass species—S. caerulea, S. autumnalis

Note: more common edible plants can be used as long as no edible parts touch the actual graywater flow. The foods produced above ground from plants rooted in graywater are just as fit to eat as plants grown in drinking quality water. Do not drink graywater!

* Plants with an asterisk beside them are not native plants to California, but are climate appropriate species for San Luis Obispo County.

Glossary of Terms

ADAPTER: Any plumbing or drip irrigation part which connects one size pipe or part to another. Often used to refer to the female fitting, whether glued or threaded, which joins different parts together.

ACTUATOR: A 24V DC motorized value, used to automatically control valves. Unlike a solenoid, this valve's opening and closing is powered by the motor, not the pressure in the pipe. Because it works without any water pressure in the pipes, it is the most practical valve for many graywater systems.

AEROBIC SOIL: A well drained soil with sufficient pore space to allow plenty of air circulation. The pore space is usually dependent upon the texture (sand is most open) and a reasonable amount of organic matter and humus.

ANIONIC SURFACTANTS: A cleaning agent, most commonly some form of sodium salt. Usually found in high sudsing detergents (see sodium chloride).

BALL VALVE: A valve which has a globe shaped rotating interior. The solid globe has a circular tunnel through it. When the handle of the valve is rotated, the solid portion of the ball cuts off the flow of water. Another rotation lines up the tunnel and water flows through the valve. Ball valves are often found at the discharge port of quality y-filters. Because ball-valves shear off any contaminants and because they don't easily wear out like gate valves, they are the preferred valve for graywater systems.

BEACHFRONT AREAS: Areas with a sand profile verses a soil profile.

CENTRIFUGAL PUMP: A pump installed outside the surge tank, not submersed in the graywater. The centrifugal pump along with a diaphragm pressure tank should be housed in or under a weatherproof structure.

CHECK-VALVE: A backflow preventer which stops any water siphoning back toward the house. Often not legal as the only backflow preventer in potable-water drip system. Must be coupled with some form of atmospheric vacuum breaker.

DRIP: A style or technology of irrigation where a tiny trickle of water is slowly applied to the soil.

DRIP HOSE ADAPTER: The first fitting after the main assembly of a drip irrigation system. Almost always an FHT (female hose thread) swivel X drip hose adapter. The female hose threads of the swivel go on to the male hose threads of a hose-bib or a transition nipple. The swivel action makes it easy to quickly add or remove this fitting. The other side of the adapter is either a slip (glue), or compression, depending on the system.

DRIP LINE: A length of solid drip irrigation hose or in-line emitter tubing.

DRIPLINE: The width of a tree's or shrub's foliage, where water would drip off the edge of the canopy. Not an indicator of the width of the root system as roots grow from one half to three times wider than the dripline.

DUAL PLUMBING: A permanent separate set of pipes for all the graywater sources in the home.

ELBOW: A fitting which allows drip hose or pipe to make 90 degree turn.

EMITTER: The little gizmos attached to or built in to solid drip irrigation hose which control the flow of water to the soil. There are many name brands that basically fall into four generic styles or technologies: single diaphragm, double diaphragm, tortuous (or complex) path, or simple orifice.

END CAP: The fitting added at the end of a lateral to make it easy to open the tubing for draining or flushing. Has a female hose thread cap with a washer which threads on to the male hose thread fitting. The other end will be either a compression, insert or other opening, depending on the system you use.

EVAPOTRANSPIRATION (ET): The loss of water from a plant or crop via transpiration (exhaling) by foliage and evaporation from the plant's and soil's surface. The ET rate is influenced by humidity, rainfall, slope aspect, wind speed, temperature, plant care and soil.

FIGURE EIGHT END CLOSURE: A simple end closure which involves threading the end of the drip hose through one side of the figure eight, bending over the end of the end of the drip hose and securing the bent end inside the other half of the figure eight.

FILTER: A device with a screen (cheap, poor quality models have plastic screens) which is used to trap any particulates, dirt, or scum before it can enter the drainfield or clog the drip emitters. An essential component of all graywater drip systems.

FHT: Plumbing shorthand for a female iron pipe thread.

FLAPPER CHECK VALVE: A valve that prevents any water from siphoning back into the surge tank.

GFI: A ground fault interrupt outlet. All sump pumps must be plugged into a GFI outlet.

HEAD: A pump's head is the gross difference in elevation which it pumps. As a safety factor, the head for a graywater system is determined by adding the total changes, both up and down, in the elevation from the surge tank to the point of disposal. To this figure add at least 15% more feet of the total head.

HOSE-BIB: Another name for a garden faucet. The standard gizmo on the pipe sticking out of the house's exterior wall or on top of a metal water pipe in the yard and onto which the garden hose is attached.

HOSE SHUT OFF VALVE: A small ball-valve which can be added at the end of a hose to control water without having to run back to the hose bib. With a few extra parts, this valve can be spliced into any drip hose and allow the gardener to exclude water from portions of a system. Often used to rotate graywater to different zones as needed.

IN-LINE EMITTER HOSE: A more recent and effective type of drip irrigation hose where the emitters are manufactured inside the hose at regular intervals. The pre-spaced emitters use a tortuous path technology for water regulation without clogging. Water can be distributed at 1/2, 1, and 2 gal/hr. rates at many separate intervals ranging from 12-72 inches.

INSERT FITTING: These fittings have male-shaped parts with barbed exteriors which insert inside the drip irrigation hose. As the water pressure increases, the fitting is more likely to fail because the swelling drip hose can bloat away from the barbed posts. Must use a ring clamp to secure the hose against too much pressure.

J-STAKE: A landscape pin used to secure drip irrigation hose, landscape netting and 12v DC wiring. Made like the upside version of the letter 'J', not as sturdy as the best U-stakes.

LABRYINTH: A complex, tortuous path inside certain emitters. The labyrinth of passages keeps any sediment in the water in suspension to pass out the emitter's orifice. All in-line emitter tubing uses some form of labyrinth to allow for a relatively large emitter orifice and to keep the emitter from clogging.

LATERAL: A lateral is a water-bearing pipe or drip hose which originates as an offshoot of a main supply pipe. Laterals are usually attached to the supply header via a tee.

MAIN ASSEMBLY: The collection of parts at the beginning of a graywater system which filters the graywater system to the drip emitters and regulates the water pressure to keep the drip system intact. Composed of a filter and pressure regulator plus the miscellaneous parts needed to connect everything together.

MAIN SWITCHING VAVLE: A main valve is required to allow the homeowner to alternate between the graywater system and the septic tank or sewer. Use the main valve when the ground is saturated with rainwater, when someone is ill with an infectious disease or the occupants don't want to use the graywater irrigation system. The main valve, whether manual or electro-mechanical, is best plumbed near the surge tank.

MESH: Most drip irrigation filters are rated by mesh size. The larger the mesh number, the better the filtration because smaller particles can be trapped. Many metal screen filters are either: 60 mesh (254 microns or .01 inches), 100 mesh (152 microns or . 006 inches), 140 mesh (104 microns or .004 inches) or 250 mesh (61 microns or .0024 inches). Graywater systems should use a 200 mesh or better filter.

MICRON: A common measurement for irrigation parts. The bigger the micron number, the bigger the opening. A single micron equals one-millionth of a meter. It takes 254 microns to equal .01 inches, which is a 60 mesh screen. Most graywater systems should have a 75 micron or better filter.
MIPT: Plumbing shorthand for a male iron pipe thread.

NIPPLE: Comes in plastic and iron versions with male iron pipe threads on each end. Plumbing nipples range in size from 3/4 inches to 48 inches. Used to join two female iron pipe threads together.

OVERFLOW PORT (AUTOMATIC): An overflow pipe near the top of the tank dumps graywater to the sewer or septic tank in case something clogs the surge tank or the sump pump fails.

PATHOGENS: Disease causing organisms. To become infected, an individual must be exposed to a large enough dosage and be vulnerable to the pathogen. Most pathogens can reside out of the body of a host, in the soil, but each disease has a different life span in the soil.

PERCOLATION TEST: A test to determine the ability of the soil to accept graywater. The test is only required at the request of the City Health Officer. Percolation tests can be useful but they may not reflect long term acceptance rates.

PHYTOPHTHORA: Genus of various species of fungal diseases which attack the upper portion of the roots to destroy the bark's active layers of transport. Often called crown rot.

POROUS HOSE: Unlike an emitter, where the water dribbles out at select points; the water in porous drip hose oozes out through the entire surface area of the hose's walls. The genre of drip hose only works well with chlorinated city water because it's so prone to getting clogged by sediment and becoming sealed off internally due to the build-up of various types of algae slimes. Not recommended at all with graywater, no matter how well filtered.

POTABLE WATER: Fresh drinking water, city or pure well water.

PRESSURE COMPENSATING EMITTER: A special type of emitter engineered so that the flow rate stays the same regardless of the length of the line (up to a point) and any change in elevation. Required when irrigating landscapes with a total elevation change of 20 feet or more.

PRE-FILTER: Usually a basket with a mesh bag which catches most of the offending lint, hair and particulates before entering the surge tank. Its filtering surface area should be at least 2 square feet so that it does not clog quickly. The bigger the pre-filter, the better. Must be used with a graywater drip irrigation system.

PRESSURE REGULATOR: A gizmo which reduces the water pressure in a graywater drip irrigation to 25 psi or lower to protect the subsequent drip irrigation fittings. Must be installed in every main assembly.

Glossary of Terms

PSI: Pounds per square inch, the unit of measure for water pressure. Typical home water pressure is 40-80 psi. Drip irrigation systems generally operate at 11-25 psi.

PVC: A type of semi-rigid plastic that is made from polyvinyl chloride which is often used for garden plumbing. Some of the more common grades of this pipe (from the sturdiest to the weakest walls) are Schedule 80, Schedule 40, Class 200 and Class 120, which resist bursting up to, respectively, 800, 400, 200 and 120 psi.

SALINE WATER: Irrigation or ground water which is high in salt (sodium chloride). While saline water is useful in many medical applications, it is not healthy for many plants. Graywater can be particularly saline due to the salts in many detergents, especially powdered detergents.

SCH: Shorthand for 'schedule'. Used to denote the type or grade of PVC pipe and fittings.

SLIP: A PVC fitting with an opening which requires glue, as opposed to threads with pipe dope, to 'weld' the two parts together. Usually the end of the rigid PVC irrigation pipe and the fitting are moistened with PVC glue and the pipe is slipped into the wet round opening of the waiting fitting.

SOLENOID: An electric valve used to control drip irrigation systems. The wires to the solenoid usually carry 24 volts of AC power. The irrigation controller has a transformer to step down the house current. It is dependent on the static line pressure of the water supply to assist in the opening and closing of the valve, therefore they often can't be used with a graywater system unless the system is fully pressurized at all times.

SPAGHETTI TUBING: A tiny or slender type of polyethylene tubing which can be used to distribute water to emitters or plants. Comes in 1/4 and 1/8 inch diameters. Because of this tubing's propensity to twist around itself, it will make a tangled mess in the landscape. Can be controlled when used in container plantings.

SUB-SYSTEM: A branched system of drip irrigation laterals originating from a main supply line or header. Unlike a single lateral, a sub-system, also called a sub-main, has several subordinate lines all connected by tees in a pattern similar to the lines on a sheet of music.

SUBMERSIBLE HIGH-HEAD EFFLUENT PUMP: A 4 inch diameter submersible turbine pump made of stainless steel and high quality thermoplastics specifically for pumping wastewater effluent. Develops higher pressures than sump pumps.

SUMP PUMP: A pump designed to be submerged in water, to automatically turn on when the water reaches a predetermined level and to pump the water a certain maximum height and distance at a specific rate in gpm of gph. Installed in the surge tank.

SUPPLY HEADER: The solid plastic pipe, solid drip hose or in-line drip irrigation hose which supplies one or more laterals.

SURFACE: Refers to the top of a thick permanent mulch covering the soil or the top of an un-mulched soil. Graywater must not daylight on the surface.

SWIVEL: The rotating fitting that can be screwed onto another fitting. Usually refers to female hose threads which are threaded onto the end of a hose, hose-bibs or drip irrigation parts. Usually requires a rubber gasket in the swivel to prevent leaks.

TEE: A fitting which joins a lateral line (solid PVC pipe, in-line emitter tubing or solid drip hose) to another water supply line.

THREE WAY SWING DIVERTER VALVE: A spa type swing gate valve which comes in manual form or with a 24V DC actuator for automatic control. Used to divert graywater flow from one zone to another zone.

TIMER: A battery powered controller which controls one irrigation line. Attaches to the hose-bib and controls the flow of water to a hose or drip irrigation system.

TORTUOUS PATH EMITTERS: Drip irrigation emitters with a complex, tortuous or labyrinth path within the emitter which allows larger particles to flow through the emitter without clogging. Best emitter for use with graywater and one of the more recent developments in drip technology.

TRANSITION NIPPLE: A plastic or metal fitting with a male hose thread and a male iron pipe thread used to connect conventional garden plumbing to drip irrigation fittings.

TWO-WAY SWING DIVERTER VALVE: A spa type swing gate valve which comes in manual form or with a 24V DC actuator for automatic control. Turns graywater flow on and off.

U-STAKE: A landscape pin used to secure drip irrigation hoses, landscape netting and 12V DC wiring. Shaped like an inverted 'U', sturdier than the J-stakes.

UNION: Related to a coupling, a union is a plumbing part which, after unthreading the locking ring, separates into two pieces and allows you to take a portion of any irrigation system (providing there is a union on each end of the section) out for repairs without having to cut the pipe. The use of unions allows for the quick reinstallation of the repaired section without having to re-glue with extra fittings.

WET SPOT: The wet spot in drip irrigation has both depth and breadth, the extent of which is dependent upon the rate of the dribble (in gph), the duration of the trickle (in hours), the soil type, the slope of the land and the climate.

Y-FILTER: The best type of filter for a graywater drip irrigation system Easily identified by the filter chamber which is integrated into the filter at an obtuse angle. The best y-filters have a metal-screen filter within the filter chamber to make it easy to flush out the screen.

AGENDA ITEM: XI-A
ACTION:_____
DATE: 2-1-10

CITY OF MORRO BAY
PLANNING COMMISSION
February 1, 2010

PROJECT SUMMARY

The applicant is requesting to construct a 178 square foot second story addition to an existing nonconforming house and a parking exception to allow a second parking space to be tandem and uncovered.

FILE NUMBERS

UP0-279 (Use Permit) &
AD0-048 (Parking Exception)

LEGAL DESCRIPTION

City of Morro Bay Parcel Map 71/46-48 Parcel A
APN-066-251-039

OWNER/AGENT

Dan Yates
221 Main Street
Morro Bay, Ca 93442

ATTACHMENTS

Findings, Exhibit A
Conditions, Exhibit B
Graphics/Plan reductions, Exhibit C

ISSUE SUMMARY:

The proposed project is an expansion of a nonconforming structure and a parking exception to allow a second tandem uncovered parking space. The house was extensively remodeled in 2006 with an addition of 70 square feet of habitable space and a new 200+/- square foot garage. Pursuant to Section, 17.56.160.B an expansion of a nonconforming structure which has had a previous expansion as this one has requires a Use Permit to allow subsequent expansions. In addition, Section 17.44.020C.1.c requires 2 covered parking spaces for single family residences. Therefore the main issue concerning this project is whether the expansion should be allowed with the second parking space being provided by a uncovered space in tandem with the existing garage.

STAFF RECOMMENDATION:

CONDITIONALLY APPROVE THE PROJECT by adopting a motion including the following action(s):

A. Adopt the Findings included as Exhibit "A";

B. Approve Conditional Use Permit subject to the Conditions included as Exhibit "B" and the site development plans dated December 10, 2009

ENVIRONMENTAL DETERMINATION: Pursuant to the California Environmental Quality Act the project is Categorically Exempt under the Class 1 exemption for existing facilities. Class 1 provides for expansion of an existing use and additions to existing structures provided that the addition will not result in an increase of more than 10,000 square feet if the project is in an area where all public services and facilities are available to allow for maximum development permissible in the General Plan and the area in which the project is located is not environmentally sensitive.

BACKGROUND:
The existing residence is located at 221 Main Street, a single family neighborhood. The following tables provide the zoning of the surrounding neighborhood and details the zoning and site characteristics of the project.

Adjacent Zoning/Land Use			
North:	R-1/PD SFR	South	R-1/PD SFR
East:	R-1 SFR	West:	WF (PD)

Site Characteristics	
Site Area	5545 square feet
Existing Use	Residence
Terrain:	Sloping lot
Vegetation/Wildlife	N/A Urbanized Site
Archaeological Resources	N/A
Access	Off Main Street
General Plan, Zoning Ordinance & Local Coastal Plan Designations	
General Plan/Coastal Plan Land Use Designation	Mixed Use Area B
Base Zone District	R-1
Zoning Overlay District	PD
Special Treatment Overlay Area	N/A
Combining District	N/A
Specific Plan Area	N/A
Coastal Zone	Inside the Coastal Commission Appeal Jurisdiction

Development Standards	Ordinance Requirement	Proposed Plan
Front Setbacks		
Building	10 feet minimum	93 feet
Garage	10 feet minimum	85 feet
Side		
Interior	3 feet minimum	3.5 feet
Exterior	6 feet minimum	N/A
Garage on exterior side	10 feet minimum	N/A
Rear	5 feet minimum	15 feet
Lot Coverage	50% maximum	25%
Building Height	25 Feet maximum	25 feet
Parking	One off-street garage or carport per unit for residences under one thousand square feet. Two, covered, enclosed parking spaces per unit for residences over one thousand square feet.	1 garage space and one tandem

PROJECT EVALUATION:

The proposal is to add approximately 178 square feet to the existing home to create a second bedroom. The addition would extend over the garage roof which is currently utilized for roof deck. The addition would meet all required setbacks and would not increase lot coverage. Pursuant to Section 17.56.160 a second addition to a nonconforming house requires an approved Conditional Use Permit. The following additional findings must be made before approving the Use Permit:

1. The enlargement, expansion or alteration is in conformance with this title;
2. It satisfies all other provision of this section, as applicable;
3. It meets applicable Title 14 requirements for a conforming use;
4. It is suitable for conforming uses and will not impair the character of the zone in which it exists; and
5. The Planning Commission finds that it is not feasible to make the structure conforming without major reconstruction of the existing structure.

The proposed addition conforms to Title 17 and would represent an expansion of a conforming use (single family). Staff has reviewed the existing house to determine if it is reasonable for the applicant to modify the existing house to make it conform to required 3.5 side yard setback. The entire north wall of the house would need to be modified approximately 1 foot to make the structure conform. This amount of reconstruction of the structure would be considered major reconstruction.

The second issue is the proposal to provide a second parking space uncovered and in tandem with the existing garage. In the R-1 district a single family residence is required to provide 2

covered parking spaces. Currently on site, there is a one-car garage approximately 12 feet by 21 feet. Section 17.44.050(B) provides that "a single family use may apply to have open tandem parking where there is a existing developed site where a second adjacent space is not feasible or on lots of forty feet or less in width." The site averages approximately 35 feet in width and therefore cannot accommodate an adjacent space. Section 17.44.050 provides that the Planning Commission may grant an exception to the parking requirements via a Conditional Use Permit upon finding the following:

A.

1. Special Circumstances: The exception will not constitute a grant of a special privilege inconsistent with the driveway or parking limitations upon other properties in the vicinity and the reduced parking or alternative to the parking design standards of this chapter will be adequate to accommodate on the site all parking needs generated by the use;
2. Health, Safety or General Welfare. The exception will not adversely affect the health, safety or general welfare of persons working or residing in the vicinity and that no traffic safety problems will result for the proposed modification of parking standards;
3. Applicant's Full Enjoyment. The exception is reasonably necessary for the applicant's full enjoyment of uses similar to those upon the adjoining real property.

The applicant has submitted a site plan that shows that a 9 by 20 foot tandem parking space can be provided on site without encroaching into the common driveway access easement. This space would meet Title17 requirements for size and access. This site plan also shows that a smaller space is available to the south of the garage. This second space can only be accessed by driving over the four foot pedestrian access, so although it may in practice be utilized for off street parking it does not have a proper accessway to it and therefore does not meet Title 17 requirements.

The parcel in question has an unusual shape as it is very narrow in width (12 feet) for a length of approximately 65 feet. This narrow accessway is encumbered by a common access easement which provides access to this property's garage and also provides access to the adjacent properties to the south. The area surrounding the subject site contains various parcels which have limited on-site parking. The reduced parking available in the surrounding area appears to be a condition of the age of the buildings and the off street requirements in place at the time these buildings were constructed. Because of these specific conditions within the neighborhood and on site a finding can be made that the granting of a parking exception will not constitute a granting of a special privilege inconsistent with the parking limitations imposed upon other properties in the vicinity. In addition, a finding can be made that the provision of a second uncovered parking space satisfies the off street parking requirements of Title 17 and therefore all required parking needs generated by the use are being met on site.

The applicant also notes on the exception supplement that the additional square footage is minor and intended to create a new second bedroom allowing the area currently used as a combination living area and bedroom to function solely as a living area making the layout more traditional. The existing house is 1,218 square feet and with the addition the habitable space will total 1,396 square feet.

Staff feels that there is sufficient documentation demonstrating that the grant of the parking exception request would not constitute a special privilege in this situation and that the exception

is reasonably necessary for the applicant to enjoy his property similarly to those properties in the vicinity.

GENERAL PLAN AND LOCAL COASTAL PLAN CONSISTENCY:

The project has been reviewed for consistency with the General Plan and Local Coastal Plan and was found to be consistent. Pursuant to Section 17.58.020.G additions to existing Single-Family homes do not require a Coastal Development Permit.

MORRO BAY MUNICIPAL CODE CONSISTENCY:

The project as proposed was routed to various Departments and Division for review. A consolidated list of conditions was prepared by staff to ensure that the project, as conditioned, is consistent with all Municipal Code requirements.

PUBLIC NOTICE:

Notice of this item was posted at the site and published in the San Luis Obispo Telegram-Tribune newspaper on Friday January 22, 2010 and all property owners of record within 300 feet of the subject site were notified of this evening's public hearing and invited to voice any concerns on this application.

CONCLUSION:

The project, as proposed, meets both the findings for approval of the Conditional Use Permit and the Parking Exception, therefore staff is recommending conditional approval of the project.

Staff Report Prepared By Kathleen Wold, Senior Planner

EXHIBIT A: FINDINGS

(Use Permit) & (Parking Exception):

Staff recommends that the Planning Commission make the following findings:

California Environmental Quality Act (CEQA)

The project was found to be exempt from further environmental review in accordance with Class 1. Class 1 provides for expansion of an existing use and additions to existing structures provided that the addition will not result in an increase of more than 10,000 square feet if the project is in an area where all public services and facilities are available to allow for maximum development permissible in the General Plan and the area in which the project is located is not environmentally sensitive.

Parking Exception Findings

A. The granting of an exception to allow the second parking space to be in tandem and uncovered pursuant to 17.44.050 will not constitute the granting of a special privilege inconsistent with the driveway or parking limitations upon other properties in the vicinity and the alternative parking provided (tandem and uncovered) will be adequate to accommodate on the site all parking needs gerated by the use.

B. The exception will not adversely affect the health, safety or general welfare of persons working or residing in the vicinity and that no traffic safety problems will result from the proposed modification of parkingstandards.

C. The exception is reasonably necessary for the applicant's full enjoyment of his property similarly to uses on adjacent property. The subject property has an unusual shape which restricts the property's ability to satisfy the two covered parking space requirement. However, the owner desires to increase the size of the home by providing a second bedroom. This proposal is similar to other propertys in the vicinity which have not provided two covered parking spaces, therefore the exception is necessary for the applicant to enjoy the same privileges as surrounding these properties.

Conditional Use Permit Findings

A. The proposed addition to the single family residence will not be detrimental to the health, safety, comfort and general welfare of the persons residing or working in the neighborhood or adjacent properties and improvements because the project has been designed to comply with all applicable regulations of the zoning district, and other applicable City standards.

B. The proposed single family residence is an allowable use in the zoning district and is in accordance with the certified Coastal Land Use plan for the City of Morro Bay.

C. The addition to this single family residence is consistent with the neighborhhood character, scale, and historic development patterns and will not create a significant impact on the adjacent neighbors access to light, air, and privacy. (Ordinance 535)

EXHIBIT B: CONDITIONS OF APPROVAL

STANDARD CONDITIONS:

1. This permit is granted for the improvements as described in the staff report, discussed at the February 1, 2010 hearing, and as depicted on plans received by the Public Services Department on December 10, 2009, except as modified by the following conditions:

2. Inaugurate Within Two Years: If the approved use is not established within two (2) years of the effective date of this approval, this approval will automatically become null and void. However, upon written request by the applicant prior to the expiration date of this approval, up to two (2) one-year time extensions may be granted. Said extensions may be granted by the Public Services Director, upon finding that the project complies with all applicable provisions of the Morro Bay Municipal Code, General Plan and Local Coastal Program Land Use Plan (LCP) in effect at the time of the extension request.

3. Changes: Minor changes to the project shall be subject to review and approval by the Public Services Director. Any changes to the approved project determined not to be minor by the Director shall require the filing of an amendment subject to Planning Commission review.

4. Compliance with the Law: All requirements of any law, ordinance, or regulation of the State of California, City of Morro Bay, and any other governmental entity shall be complied with in the exercise of this approval. This project shall meet all applicable requirements under the Morro Bay Municipal Code, and shall be consistent with all programs and policies contained in the certified Coastal Land Use Plan and General Plan for the City of Morro Bay.

5. Hold Harmless: The applicant, as a condition of approval, hereby agrees to defend, indemnify, and hold harmless the City, its agents, officers, and employees, from any claim, action, or proceeding against the City as a result of the action or inaction by the City, or from any claim to attack, set aside, void, or annul this approval by the City of the applicant's project; or applicants failure to comply with conditions of approval. This condition and agreement shall be binding on all successors and assigns.

6. Compliance with Conditions: Compliance with and execution of all conditions listed hereon shall be necessary, unless otherwise specified, prior to obtaining final building inspection clearance. Deviation from this requirement shall be permitted only by written consent of the Planning and Building Director and/or as authorized by the Planning Commission. Failure to comply with these conditions shall render this entitlement, at the discretion of the Director, null and void. Continuation of the use without a valid entitlement will constitute a violation of the Morro Bay Municipal Code and is a misdemeanor.

7. Water Saving Devices: Prior to final occupancy clearance, water saving devices shall be installed in the project in accordance with the policies of the Morro Bay Coastal Land Use Plan and as approved by the Building Official.

8. Screening of Equipment/Utility Meters/Fencing: No roof-mounted air conditioning, heating equipment, vents, ducts or other mechanical equipment shall be allowed to extend above the parapet walls. All utility meters shall be suitably screened from public view as approved by the Public Services Department. Prior to building permit issuance, the approved method of screening shall be shown on the project plans.

9. Construction Hours: Pursuant to MBMC Section 9.28.030 (I), noise-generating construction related activities shall be limited to the hours of seven a.m. to seven p.m. during the weekdays and eight a.m. to seven p.m. during the weekends, unless an exception is granted by the Director of Planning & Building pursuant to the terms of this regulation.

10. Utility Services: All fees, including water and sewer impact fees, shall be paid at the time the building permit is issued unless otherwise noted.

11. UBC Compliance. The entire project, including all setbacks, exterior wall openings and handicapped accessible issues, shall comply with the Uniform Building Code, as determined by the Building Official.

PLANNING CONDITIONS:

1. Building Height Verification: Prior to either roof nail or framing inspection, a licensed surveyor shall submit a letter to the building inspector certifying that the height of the structures are in accordance with the approved plans and complies with the height requirement of **25 feet above average natural grade as accepted by the City Engineer**.

2. Dust Control: That prior to issuance of a grading permit, a method of control to prevent dust and wind blow earth problems shall be submitted for review and approval by the Building Official.

3. Archaeology: In the event of the unforeseen encounter of subsurface materials suspected to be of an archaeological or paleontological nature, all grading or excavation shall immediately cease in the immediate area, and the find should be left untouched until a qualified professional archaeologist, knowledgeable in local indigenous culture, or paleontologist, whichever is appropriate, is contacted and called in to evaluate and make recommendations as to disposition, mitigation and/or salvage. The developer shall be liable for costs associated with the professional investigation.

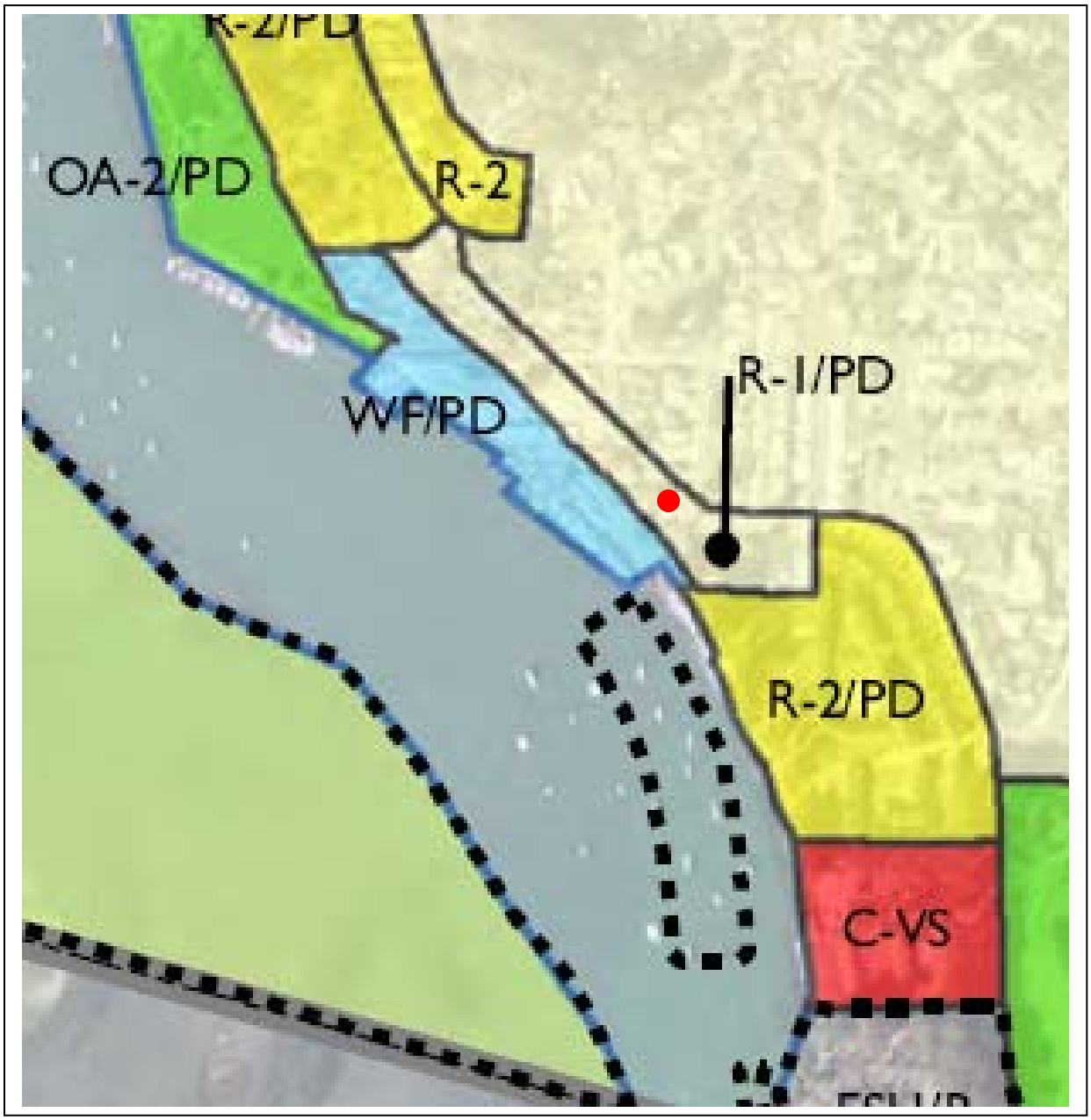
PUBLIC WORKS CONDITIONS:

1. Building Plans: Plans submitted for building permit review shall show existing drainage facilities and reference the easement.

2. Encroachment Permit: No work shall occur within (or use of) the City's Right of Way without an encroachment permit. Encroachment permits are available at the City of Morro Bay Public Services Office located at 955 Shasta Ave.

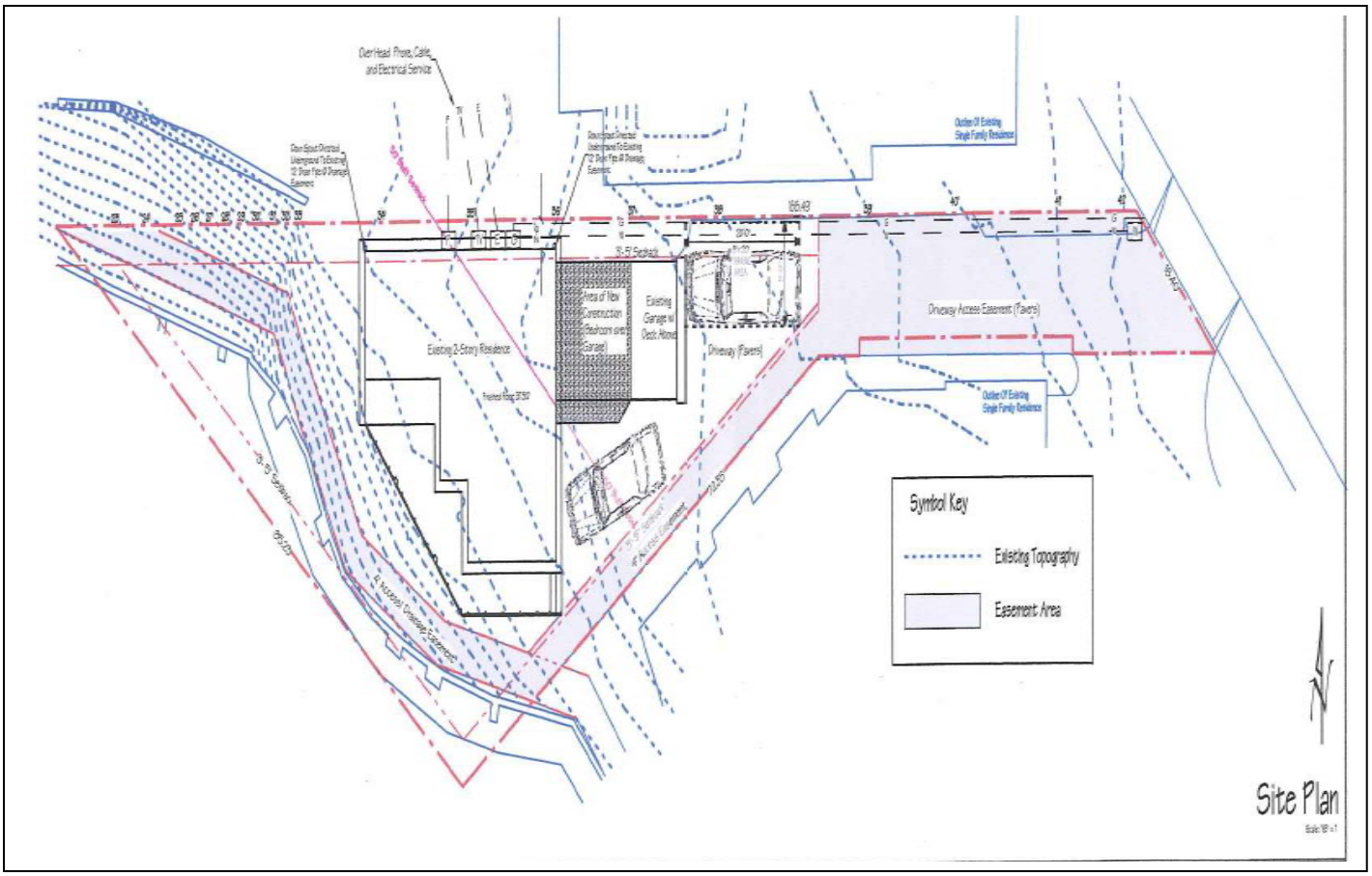
3. Repair of City facilities: Any damage, as a result of construction operations for this project, to City facilities, i.e. curb/berm, street, or any public improvements shall be repaired at no cost to the City of Morro Bay.

EXHIBIT C: GRAPHICS AND PLAN REDUCTIONS



Planning Commission
Daniel Yates

ZONING MAP



Planning Commission
Daniel Yates

Site Plan

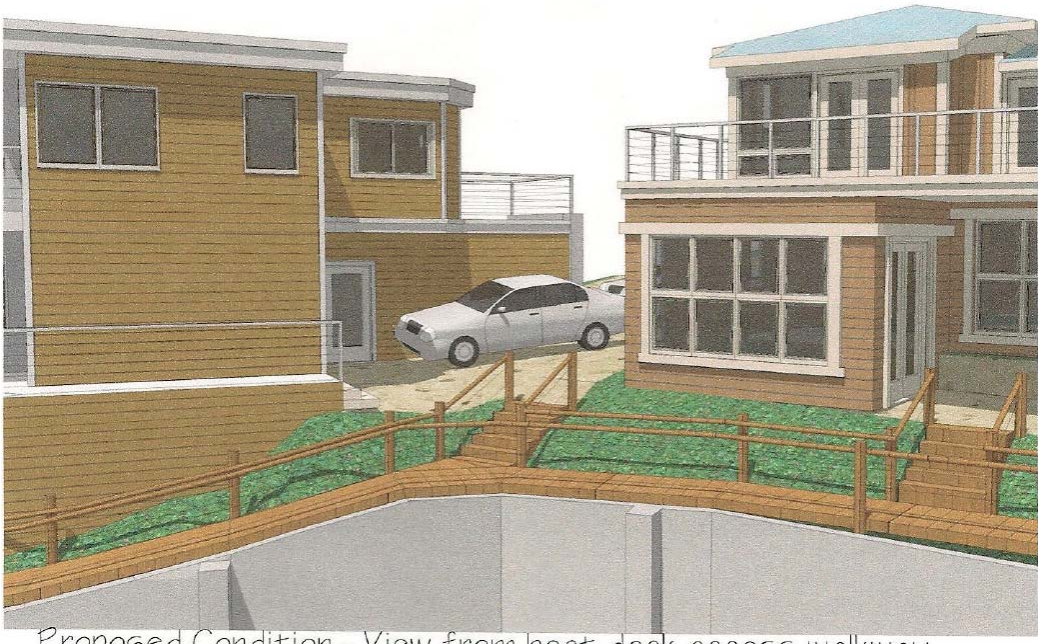
Existing Condition - View from property line
of 4 foot public access easement

Proposed Condition - View from property line
of 4 foot public access easement

Planning Commission
Daniel Yates

Elevation

Existing Condition - View from boat dock access walkway



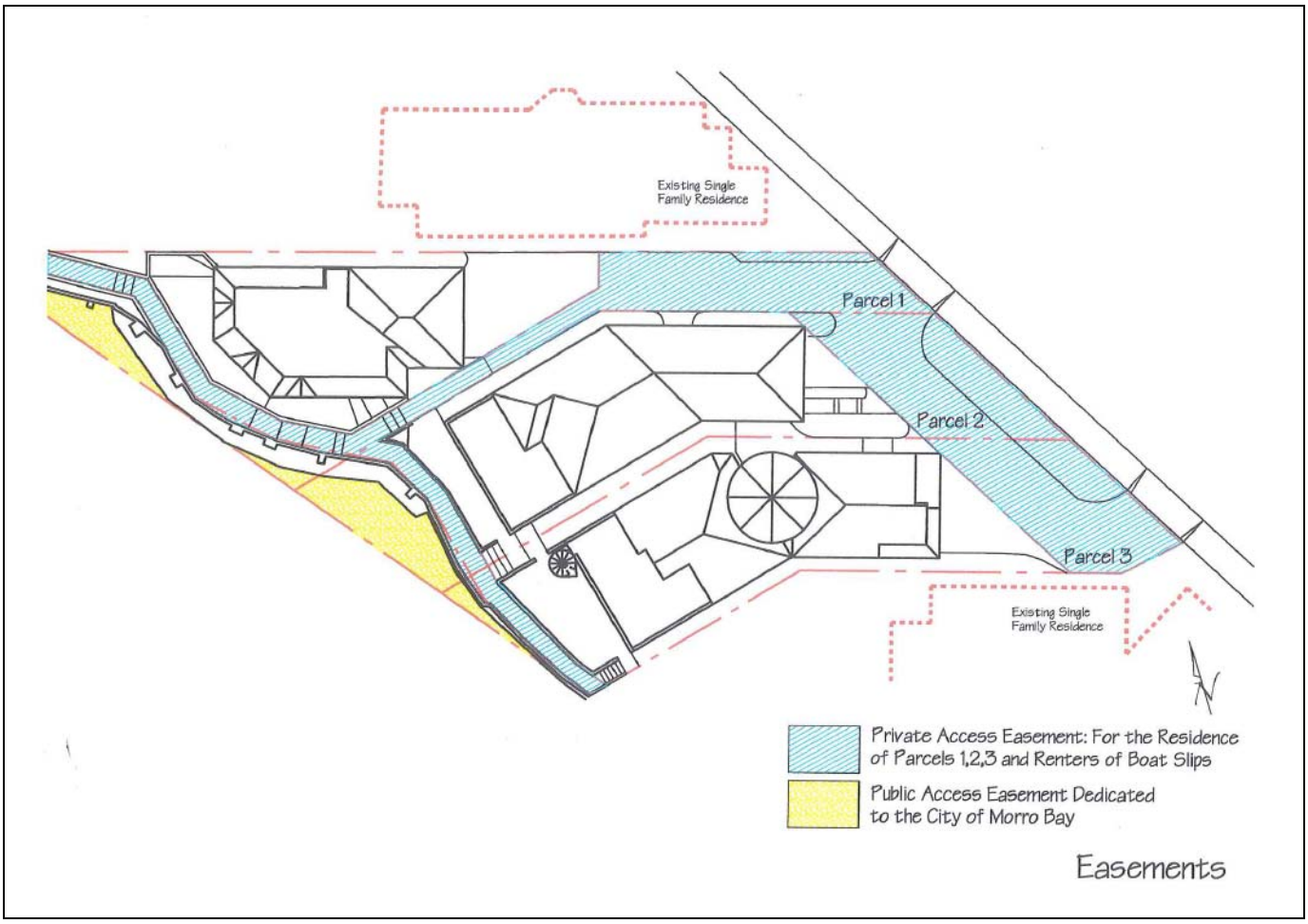
Proposed Condition - View from boat dock access walkway

Planning Commission
Daniel Yates

Elevation

Planning Commission
Dan Yates

Photos



Planning Commission
Jon Wickstrom

Access Easements

AGENDA ITEM NO. XII·A
DATE: 2·1·10
ACTION:

	Applicant/Property Owner	Project Address	Date	Project Des	Project Planner	Approval Body
Hearing or Action Ready						
1	Dan Yates	221 Main	12/11/09	**SF added to NCS and Parking Exception.** Scheduled for hearing 2/1/10.	KW	PC
New Submittals						
2	Bob Crizer	Water Lease Site 34 206 Main St./Oak St.	11/9/09	**Oak Street Parking Exception.** Also see 206 Main St. (Botich). Request to allow parking spaces to be placed on Oak street to replace parking currently provided at 206 Main Street. Waiting for parties to resolve issue of ownership.	KW	PC/CC
3	City of Morro Bay	Harbor Department	11/10/09	**Marina Dredging.** CUP to dredge.	KW	PC
4	Cathy Novak	560 Embarcadero	12/3/09	**Height & Setback Excecption for Fence/Windscreen.**	GL	PC
30 -Day Review, Incomplete or Additional Submittal Review						
5	Wayne Colmer	485 South Bay	4/28/05	**17 Lot Subdivision.** Submitted 4/28/05.SRB 3/15/06, Staff requested information Starting Initial Study. MND Circulating, tentative PC 8/21/06 Approved, tentative CC 10/9 Continued to 11/13/06 Approved Appealed by CCC Tentative November hearing Continued to March, CCC approved with Conditions, Pry Mod PC concurrence needed pending lawsuit; Resubmitted 11/19/08; awaiting CCC appeal and concurrence; Approved by CCC; 2/17/09 PC continue to date uncertain with direction. Applicant is addressing traffic concerns.	KW	PC
6	Mark Hoppe	2840 Cedar	11/18/09	**Demo SFR.** Fire department O.K. 12/4/2009. Incomplete letter sent 12/23/09.	GL/SD	Admin
7	Valley and Crafton	430 Olive	11/23/09	**Lot Line Adjustment.** Incomplete letter sent 12/23/09.	GL/SD	Admin
8	Larry Newland	Embarcadero	11/21/05	**Embarcadero-Maritime Museum (Larry Newland).** Submitted 11/21/05, Incomplete 12/15/05 Resubmitted 10/5/06, tentative CC for landowner consent 1/22/07 Landowner consent granted. Incomplete 3/7/07. Resubmitted 5/25/07 Incomplete Letter sent 6/27/07 Met to discuss status 10/4/07 Incomplete 2/4/08. Met with applicants on 3/3/09 regarding inc. later. Applicant resubmitted additional material on 9/30/2009.	KW	PC
9	Dan Reddell	1 Jordan Terrance	7/25/08	**New SFR.** Submitted 7/25/08, Inc. Later 8/19/08; resubmitted 2/24/09, project under review. Letter sent to agent regarding issues. Applicant and staff met 1/2010 on site to further discuss issues.	JH/KW	PC
10	Kleinhammer	160 Anchor	7/29/08	**Parcel Map** dividing one parcel into two with Right of Way abandonment. Incomplete letter sent.	KW	PC/CC
11	Pina Noran	2176 Main	10/3/08	**Convert commercial space to residential use.** Submitted 10/03/08, Inc. Later 10/22/08, resubmitted 2/5/09. Project still missing vital information for processing.	KW	PC
12	Greg Kircher	350 Java	1/22/09	**Addition to Nonconforming SFR.** Submitted 1/22/09, incomplete letter 2/27/09, incomplete 5/21/09, Response letter 6/30/09. Resubmittal 1/7/10.	KW	PC
13	John Christie	2330 Hemlock	4/27/09	**2nd unit** to nonconforming site. No scaled plans submitted. Comment letter sent 11/3/09.	GL	PC
14	Todd Schnack	2248 Emerald	9/30/09	**New Guesthouse Cloisters,** 11/09 incomplete letter sent. Applicant responded 11/19. Cloisters Design Reviewed project 11/30 deemed it in comformance with Cloister Design guidelines. Comment Letter sent 12/22/09.	GL	PC

	Applicant/Property Owner	Project Address	Date	Project Description/Status	Project Planner	Approval Body
15	Phil & Maureen Kispersky	560 Embarcadero	9/30/09	**Sign Permit for Pelican Grill.** Waiting for resubmittal. Submittal 12/14/09. Comment letter sent 12/22/09. Applicant resubmitted on 1/5/10.	GL	Admin
16	Studio Design Group	962 Piney	10/15/09	**Preapplication Demo.,** addition and remodel of existing church., application taken to DRT. Incomplete letter sent 12/4/09.	KW	PC
17	Les & Larri Deedon	3044 Ironwood	10/21/09	**New SFR.** 2-story 1,412 sq. ft.with 3 car garage and 2 decks. Incomplete letter sent to applicant 10/29/09. applicant resubmitted on 11/18/2009. Resubmittal did not address all incomplete items. Incomplete letter sent 12/9/09. Responses received 1/22/10.	GL/AC	Admin
18	Kent Snowden	2570 Nutmeg	10/27/09	**New SFR.** 2,437 square feet with a 616 square foot garage. Incomplete letter sent to applicant 11/4/09. P.W.comments 11/18/2009. Resubmittal 1/19/10.	SD	PC
19	Robert Romero	3033 Ironwood	11/18/09	**New SFR.** Incomplete Letter sent 12/11/09.	GL/AC	Admin
20	Robert Tefft	395 Acacia	11/10/09	**Demo SFR & Carport.** Incomplete letter sent 12/31/2009.	GL/SD	Admin
21	Mike Prater	235 Atascadero	12/16/09	**Solar Arrays.** Solar arrays located on carport structures at Morro Bay High School. Incomplete letter sent 1/15/10.	GL	PC
Projects in Process						
22	Great American Fish Co.	1185 Embarcadero	1/6/05	**GAFC, Virg's, & Harbor Huts Revitalization Plan.** Submitted 1/06/05, Starting Initial Study Draft MND, eel grass study complete concurrence on findings Tentative PC 11/5/07 Continued, date uncertain CC March Phase I approved Phase II approved 5/12/08. CDP approval from Coastal Commission on June 10, 2009. Project submitted for precise review.	KW	PC
23	Rudolph Kubes/Mike Prater	1181 Main & Bonita	11/23/06	**Morro Mist 20 Lot SFR Subdivision.** Submitted 11/23/06,SRB 3/15/06, Staff requested information Resubmitted 8/16/06 MND analysis needed MIND Complete 7/20 PC 8/20/07 Continued date uncertain revised project smaller units still 100% residential. Applicant has redesigned project and resubmitted on June 1, 2009. Project under review. Letter sent to applicant regarding issues on 7/2009. Subsequent meeting with applicant team 8/2009. Staff has had additional correspondence with the applicant. Project tentatively scheduled for Planning Commission late February/early March 2010.	JH/KW	PC
24	Frank Loving	247 Main	10/27/07	**Docking for Vessels.** Submitted 10/29/07, Incomplete 11/19/07 PC 2/4/08, Continued to PC 3/17/08, continued to PC 9/15/08 Applicant has indicated to staff that they wish to move ahead with the project.	KW	PC

	Applicant/Property Owner	Project Address		Date	Project Description/Status	Project Planner	Approval Body
25	Johnnie Medina	3390	Main	5/29/08	**2 Lot Subdivision.** Submitted 5/29/08, Incomplete CCC coordination; Inc. Later 12/2/08; Resubmitted 1/5/09. Staff working on environmental document, MND Noticed as available for review 6/9/09. Hearing schedule 7/20/09. Item continued to date uncertain. Applicant submitted additional materials, staff waiting for applicant's response to ESH/Willow buffer. Biologist letter submitted November 30, 2009. Resubmittal 1/20/10.	KW	PC
26	City of Morro Bay & Cayucos	160	Atascadero	7/1/08	**WWTP Upgrade.** Submitted 7/1/08, Preparing Notice of Preparation, Staff reviewing Ad Min Draft EIR. Modifications to project description underway and subsequent renoticing.	BA	PC/CC/RW QCB
27	Nina Hartley	1290	Embarcadero	9/17/08	**Relocate well and pump house.** Submitted 9/17/08, Inc. letter 10/15/08. Applicant has resubmitted items from inc. letter, submittal under review. Initial Study in process. Applicant has submitted additional arch/information 11/09.	KW	PC
28	Chevron	3072	Main	12/31/08	**Remove Underground Pipes.** Submitted 12/31/08, environmental reports submitted for review 5/8/09. Project under review. Project routed to other agencies for comment. Environmental being processed.	KW/SD	PC
29	Candy Botich	206	MainWater Lease Site 34 Main & Oak St.	6/17/09	**New Parking.** Project under review. Agent given DRT comments July 10, 2009. Applicant submitted redesigned project 9/30/2009. Associated application submitted for a parking exception for the lease site generating the parking demand.	KW	PC/CC
30	Gene Doughty	201	Main	7/24/09	**Subdivide one lot into three.** Comment letter sent 8/19/09. Resubmittal 12/22/09.	KW	PC
Environmental Review							
31	Ron McIntosh	190	Olive	8/26/08	**New SFR.** Submitted 8/26/08, Inc. Letter 9/24/08; Resubmitted 12/10/08, 1/9/09 request for more information. Applicant resubmitted on 2/06/09. Environmental under review. Applicant and City agree to continuance.	GL	PC
32	Chevron	3072	Main	12/31/08	**Remove Underground Pipes.** Submitted 12/31/08, environmental reports submitted for review 5/8/09. Project under review. Project routed to other agencies for comment. Environmental being processed.	KW/SD	PC
33	Smith Held	575& 591	Embarcadero	04/21/09	**Demo existing retail and vacation rentals, construct 2 retail units and a 6 unit hotel.** Submitted 9/27/06, Incomplete 11/7/06 Resubmitted 12/21/06 Environmental Review MND Circulating, tentative PC 4/2/07 Continued, date uncertain Resubmitted 4/26/07 Incomplete 5/2/07 Resubmitted 5/30/07 Environmental document re-circulating 6/6/07, tentative PC 7/16/07 Concept plan approved, tentative CC 8/27/07 Concept Plan Approved, needs CDP from CCC -Hearing 11/12/08. Project back from Coastal Commission, ready for Precise Plan processing. Precise Plan submitted 4/21/09, Incomplete letter 6/25/09. Resubmitted 7/27/2009. Responses to applicant on 10/12/2009. Scheduled for hearing on 10/19, continued to 11/2 by applicant. Applicant requests continuation to date uncertain. Revised environmental in process.	GL	PC
34	Imani	571	Embarcadero	5/14/09	**Remodel of Salt Building** to include new public walkway and additional piling for support. Eel grass study submitted. Initial Study in process.	GL	PC

	Applicant/Property Owner	Project Address		Date	Project Description/Status	Project Planner	Approval Body
35	City of Morro Bay	235	Main	10/20/09	**Demolish Wharf.** Demo 7,400 sf. wharf, decking and support structure. Initial Study was circulated for 30-day review on 1/14/10.	KW	Admin
Coordinating with Other Jurisdictions							
36	Burt Caldwell	801	Embarcadero	5/15/08	**Conference Center.** Submitted 5/15/08, Inc Ltr 5/23 Resubmitted MND Circulating 7/15/08 PC 9/2 Approved, CC 9/22/08 Approved, needs CDP from CCC.	GL	PC/CC/ CCC
37	City of Morro Bay	887	Atascadero	3/9/09	**Nutmeg Water Tank Upgrade (City of Morro Bay CIP project).** Oversight of County of San Luis Obispo application process. Preapplication meeting 3/9/09. Consultant coordination meeting 3/12/09.	KW	SLO County
38	John King	60	Lower State Park	7/2/08	**Lower parking lot resurface and construction of 2 new stairways.** Submitted 7/02/08, PC Tent 10/6, PC Date TBD Applicant coordinating w/ CCC 10/20/08.	KW	PC
Projects Continued Indefinitely or No Response to Date on Incomplete Letter							
39	SLO County		State Park	09/28/04	**Master Plan for Golf Course.** Submitted 9/28/04, On hold per applicant, project to be amended. Resubmitted 2/9/07 Tentative PC 3/19/07 Continued, date uncertain; Planting trees.	KW	PC/CC
40	Cameron Financial	399	Quintana	04/11/07	**New Commercial Building.** Submitted 4/11/07, Inc. Letter 5/09/07.	KW	Admin
41	West Millennium Homes	895	Monterey	7/10/07	**Mixed-use building.** 16 residential units and 3 commercial units, Submitted 7/10/07, Inc Later 7/25 Resubmitted 1/14/08 SRB 3/10/08.	KW	PC
42	Kenneth and Lisa Blackwell	2740	Dogwood	07/20/07	**Addition to nonconforming residence.** Submitted 7/20/07, Complete, tentative PC 9/17/07 Continued, date uncertain Resubmitted 10/31/07, PC 12/17/07 Continued, date uncertain.	KW	PC
43	Jeff Gregory	1295	Morro	09/25/07	**Coastal Development Permit to allow a second single family residence on lot with an existing home.** Incomplete letter sent 10/9/2007. Intent to Deem Application Withdrawn Letter sent 12/29/09. Response from applicant 1/8/10 keep file open indefinitely.	KW	AD
44	Nicki Fazio	360	Cerrito	08/15/07	**Demo/Reconstruct SFR.** Submitted 8/15/07, Incomplete 9/12/07, Complete and noticed 9/24/07. Issued 10/5/07, Appealed 10/15/07, Tentative PC 12/3/07 Continued, date uncertain. Applicant has made contact with staff regarding moving project along but no submittal to date.	KW	PC
45	Alicia Baroque	545	Napa	05/27/08	**New guest house and parking exception.** Submitted 5/27/08 Incomplete 6/13/08 Resubmitted 10/14/08, Complete 11/10, PC 12/15; Continued to a date uncertain.	KW	PC
46	City of Morro Bay	595	Harbor Depart	02/27/09	**New stand-by generator.** Submitted 2/27/09, City Council did not fund. Continued date uncertain.	KW	Admin
Projects in Building Plan Check							
47	Don Doubledee	360	Morro Bay Blvd	5/15/09	**Mixed Use Project.**	GL	N/A
48	Travis Leage	1155	West	11/17/09	**SFR.** Incomplete Letter sent 12/22/09. Resubmittal 1/19/10.	SD	N/A
49	Robert Fiori	2655	Koa	11/25/09	**SFR Demo/Reconstruction.** Incomplete letter sent to applicant.	KW	N/A
50	Victor Graziano	515	Morro Bay Blvd	11/19/09	**Convert Portion of Retail to Deli.** Incomplete letter sent 12/10/09.	GL	N/A

	Applicant/Property Owner	Project Address		Date	Project Description/Status	Project Planner	Approval Body
51	Robert & Paula Coomer	3440	Toro	12/28/09	**Retaining Wall.** Permit issued.	KW	N/A
52	Cathy Novak	585	Morro	12/23/09	**As-Built Review of Community Housing Project.** In progress.	KW	N/A
53	Gary Christiensen	600	Morro Bay Blvd	1/21/10	**Tentant Improvement.** Pharmacy / Retail.	GL	N/A
54	Costanzo Addition	1202	Bolton Dr	1/25/10	**SFR Addition.** Add stairs to the existing house.	GL	N/A
Completed Projects							
55	Cathy Novak	612	Agave	9/17/09	**Parcel Map.** One lot to three lots. Incomplete letter sent to applicant. Applicant respond to items on letter 11/4/2009. Subdivision Review Board approved the map for processing on 11/17/2009. Item continued until 1/4/09, staff to bring back findings. Approved 1/19/10.	GL	PC
56	Michael Del Puppo	2300	Main	4/3/09	**Appeal of Minor Use Permit** to convert a commercial use to a residential use. Approved 11/13/09. Appeal denied 1/19/10.	GL/SD	PC
57	Gerald Luhr	540	Atascadero	1/15/10	**Sign Permit.** "Kitchen and Bath Works".	KW	Admin

City of Morro Bay
Public Services
Advanced Planning Work Program

Work Item	Planning Commission	City Council	Coastal Commission	Comments	Estimated Staff Hours
Neighborhood Compatibility Standards (Variable Height & Setbacks, FAR)	TBD	TBD			120 to 160
Strategic plan for managing the greening process	7/6/09	12/14/09		Pending County AB811 analysis and Board of Supervisor's action.	200 to 300
AB811	7/6/09	8/24/09			120 to 160
Safety Element	Approved	TBD			20 to 40
Draft Urban Forest Management Plan	TBD	TBD			200 to 300
CEQA Implementation Guidelines	TBD	TBD	NA		120 to 160
Update CEQA checklist pursuant to SWMP (2/2011)	TBD	TBD			120 to 160
Downtown Visioning	TBD	TBD			120 to 160
PD Overlay	TBD	TBD			3/20/00
Annexation Proceeding for Public Facilities		TBD			TBD
Planning Commission Generated Items					
Work Item	**Requesting Body**				**Estimated Staff Hours**
Pedestrian Plan	Planning Commission				TBD
Items Requiring Further Analysis When Activated					
Work Item	**Plng. Comm.**	**City Council**	**Coastal Comm.**		**Estimated Staff Hours**
Updated Zoning Ordinance	TBD	TBD			1,800
Updated General Plan/LCP	TBD	TBD			1,800
NPDES Storm Water Management Plan			Approved By RWQCB 2/17/09		
Completed projects					
Housing Element Update/ SB 1818	10/26/09	11/9/09		Submitted to HCD by 6/17/09. HCD returned comments 8/2009. Staff/consultant responded to comments 9/15/2009. Item scheduled for P.C. on 10/5/2009. Revised PC date to 10/19/2009. Submitted responses to HCD comments on 9/15/2009. P.C. forwarded a favorable recommendation on Neg Dec and 2009 Element. City Council adopted the Neg Dec and 209 Housing Element with minor modifications. Housing Element Certified by State Department of Housing and Community Development	200 to 300

AGENDA ITEM NO. XII · B
DATE: 2·1·10
ACTION:

Staff Report

TO: **Honorable Mayor and City Council** **DATE: January 5, 2010**

FROM: **Bruce Ambo, Public Services Director**
Kathleen Wold, Senior Planner

SUBJECT: **2009 Annual Water Report**

RECOMMENDATION:
Staff recommends that the City Council adopt the following:

MOTION: I move that the City Council grant the following allocations for 2010 and key subsequent actions on water supply issues to the forthcoming Urban Water Management Plan update:

1. Allocate the mix of residential units at 60 percent single-family and 40 percent multi-family units; and authorize the corresponding water equivalency allocation for residential uses at 50 WEU's (water equivalency units); and
2. Process Residential Allocations limits on a first-come first-serve basis, based on the priorities contained in the current General Plan and Local Coastal Plan policies; and
3. Authorize allocation of 130% of the residential water equivalency units (65 WEUs) to commercial and industrial projects, within the priority categories consistent with the current Local Coastal Plan and General Plan policies; and
4. Review the Water Supply Portfolio in light of recent decreases in the reliability of the State Water Project water deliveries as part of the 2010 Urban Water Management Plan update.

FISCAL IMPACT:
No fiscal impact is anticipated since it is not likely that the full allocation will be necessary.

DISCUSSION:

The purpose of this report is to provide the annual report on the water equivalency program. This report summarizes building activity for the 2009 and provides a recommendation on the maximum number of WEU's which should be granted for the 2010. Due to recent changes in state water deliveries we are also recommending that the Water Supply Portfolio be

Prepared By: _____ **Dept Review:** _____

City Manager Review: _____

City Attorney Review:

reviewed as part of the 2010 Urban Water Management Plan update. This review will address both the decrease in the amount of state water being delivered and the reliability of those deliveries.

SUMMARY:
The last annual water report was adopted by the Council in January 24, 2008 to allocate 50 WEU's with 60 percent to be used for single family dwellings and 40 percent for multiple family dwellings.

For the 2009 calendar year, the Public Services Department continued to process residential coastal permits and building permits simultaneously on a first-come, first-serve basis. Water equivalencies are recorded for tracking purposes when building permits are issued.

Progress Report on the Distribution of Water Equivalency Units for 2009: In February 2008, the City Council approved the annual allocation for the 2008 calendar year of 50 WEU's with 60 percent to be used for single family dwellings and 40 percent for multiple family dwellings, and no rollovers. 65 WEU's, or 130% of residential WEU's, were allocated for commercial and industrial uses.

Historically the City Council allocated a total of 160 WEU's including both the residential allocation and the 130 percent allocation to commercial and industrial until 2002. That number was increased to a total of 230 WEU's until the 2006 allocation approval, which reduced the total by half or 115 WEU's.

Table 1 indicates the number of water equivalency units allocated to various uses as of December 31, 2009. Minor commercial activity continues with remodels and reuses of existing buildings that do not require allocations of water. There were no WEU's allocated to commercial uses during 2009.

From January 1 to December 31, 2008, the Public Services Department issued 7 single-family residential (SFR) building permits, and 1 multiple-family residential (MFR) building permit for a total of 11 new dwelling units. There were three commercial building permits issued which required additional WEUs for a total of 3.97 WEUs. The total WEUs issued in 2008 was 12.11

From January 1 to December 31 2009, the Public Services Department issued 5 single family residential (SFR) building permits. The only multiple-family activity in 2009 was an addition which did not require any additional WEUs. There were no commercial permits issued which required additional WEU's. The total WEUs issued in 2009 was 2.62

Water Management Plan: In December 2008 the City Council reviewed the conditions of the community's long-term potable water supply and as a result approved the Water Management Plan Status Report. This report, performed at least every 5 years, looked at: "any changes in climatic, hydrological, technological, or political conditions that could affect the City's long-term water supply whether negatively or positively." It was determined as a result of the review that the existing resources are adequate and sustainable for build-out of the community in accordance with the General Plan. The City Council also authorized a water usage study that was prepared by the City's consulting engineering firm this study also determined that there is adequate water for the build-out of the City under the current General Plan.

In 2010 the City is facing a short term water challenge due to greatly reduced State Water Project deliveries coupled with the nitrate contamination of both the Morro and Chorro groundwater basins. The timing of these events has caused a short term impact to the City's ability to supply water. As the projects designed to alleviate these issues are implemented these impacts will be ameliorated. As part of the 2010 Urban Water Management Plan update the Water Division will be reviewing the long term water supply portfolio."

Potable Water Production Data: As shown in Table 3, for calendar year 2009 a total of 235 acre-feet of water was extracted from the City's Chorro Basin, 80 acre feet came from the Morro Basin, 1069 acre-feet were delivered from the State Water Project (SWP), and 64 acre feet from the desalination plant. For the calendar year 2009 a total of Table 3 shows the total water production for this year was 1448 acre-feet.

Table 4 provides an historical record of water production and use from 1960 through 2009. Beginning in 1997, per capita water use has been re-calculated, based upon the amount of water delivered to customers (metered/sold) rather than gross production, to closely reflect actual community consumption practices.

The 2009 average consumption was 120 gallons per capita per day (gpcd). In accordance with the Water Management Plan (page 1, Section 2), this consumption is below the 130-gpcd threshold amount for extensive consumer education and more stringent conservation measures than under Normal Water Supply Conditions.

Water Allocation Mix: Water equivalencies units (WEU's) are allocated each year for residential, commercial and industrial uses. The mix of WEUs is based upon the historic pattern of development. Recent years have seen a greater demand for development of single family units than multiple family units. The past few allocations have been granted at a 60/40 mix between Single Family and Multiple family categories. This mix has served the community well therefore no changes have been recommended.

Historic Growth: The maximum number of 77 units contained in Ordinance 266 has been reviewed for its continued applicability given the population goal was set for 12,200 by the year 2000. That year has now passed and Morro Bay's current population is 10,555 well below the maximum set for year 2000. The maximum number of housing units under Ordinance 266 was 6,672 unless there was an election to allow further building. The current number of housing units is 6496 or 176 units below the cap. It appears that historically there have other factors limiting growth beyond the limits set by Ordinance 266.

BACKGROUND:

Pursuant to the Amended Section 13.20.060 of the Municipal Code, the Annual Water Report has been prepared by the Public Services Department and forwarded to the City Council for consideration and adoption. This report describes the uses that have received water equivalency allocations in 2009 (Table 1), and provides the Departments recommendation regarding the building allocation for residential units and the suggested mix of multi-family and single family residential units for 2009 as indicated in City Council Resolution No. 78-00. That resolution indicated that the City Council would continue to set an annual limit on residential units and their mix as set forth in Ordinance 266. In addition, this report provides a snapshot of the City's population (Table 2), water production (Table 3), per capita water use trends (Table 4), and water loss estimates (Tables 5 & 6).

CONCLUSION:

Documentation contained in this report substantiates that that there is sufficient water resources to grant the recommendations as contained in this report while ensuring compliance with all requirements within Ordinance 266. In 2010 the City is facing a short term water challenge due to greatly reduced State Water Project deliveries coupled with the nitrate contamination of both the Morro and Chorro groundwater basins. The timing of these events has caused a short term impact to the City's ability to supply water. As the projects designed to alleviate these issues are implemented these impacts will be ameliorated. As part of the 2010 Urban Water Management Plan update the Water Division will be reviewing the long term water supply portfolio."

ATTACHMENTS

A. Table 1: Distribution of Water Equivalency Units
B. Table 2: Population
C. Table 3: Water Production
D. Table 4: Per Capita Water Use

TABLE 1 ANNUAL ALLOCATIONS

2009 (1/1-12/31/09)	Allocation Year
Total WEU Available **Total WEU Allocated**	**115.00** **2.62**
Residential weu Available	Equivalencies Allocated
50 water equivalency units 5 sfr units 0 mfr units Total	 2.62 0 2.62 (less than 50 allocated)
Commercial weu (rounded)*	Allocated
"A" "B"	0 0
Industrial	0

* 130 percent of residential or 65 weu

2008 (1/1-12/31/08)	Allocation Year
Total WEU Available **Total WEU Allocated**	**115.00** **12.11**
Residential weu Available	Equivalencies Allocated
50 water equivalency units 7 sfr units 1 mfr units Total	 6.54 1.6 8.14 (less than 50 allocated)
Commercial weu (rounded)*	Allocated
"A" "B"	3.97 0
Industrial	0

* 130 percent of residential or 65 weu

2007 (1/1-12/31/07)	**Allocation Year**
Total WEU Available **Total WEU Allocated**	**115.00** **37.44**
Residential weu Available	Equivalencies Allocated
50 water equivalency units 28 sfr units 18 mfr units Total	 25.7 10.2 35.9 less than 50 allocated
Commercial weu (rounded)*	Allocated
"A"	1.15
"B"	0
Industrial	0.39

* 130 percent of residential or 65 weu

2006 (1/1-12/31/06)	**Allocation Year**
Total WEU Available **Total WEU Allocated**	**230.00** **48.22**
Residential weu Available	Equivalencies Allocated
100 water equivalency units 37 sfr units 8 mfr units	 35.62 5.76
Commercial weu (rounded)*	Allocated
"A"	3
"B"	3.84
Industrial	0

* 130 percent of residential or 130 weu

2005 (1/1-12/31/05)	**Allocation Year**
Total WEU Available **Total WEU Allocated**	**230.00** **63.78**
Residential weu Available	Equivalencies Allocated
100 water equivalency units 46 sfr units 10 mfr units	 40.48 6.17
Commercial weu (rounded)*	Allocated
"A"	15.5
"B"	1.63
Industrial	0

* 130 percent of residential or 130 weu

2004 (1/1-12/20/04)	**Allocation Year**
Total WEU Available **Total WEU Allocated**	**230.00** **41.86**
Residential weu Available	Equivalencies Allocated
100 water equivalency units 28 sfr units 19 mfr units	 28 11.42
Commercial weu (rounded)*	Allocated
"A"	0
"B"	2.44
Industrial	0

* 130 percent of residential or 130 weu

2003 (1/1-12/31/03)	Allocation Year
Total WEU Available*	**262.00**
Total WEU Allocated	**70.42**
Residential weu Available	Equivalencies Allocated
100 water equivalency units 54 sfr units 15 mfr units	 54 8.86 (MFR)
Commercial weu (rounded)**	Allocated
"A"	7.56
"B"	
Industrial	0

* Includes one time allocation
for Colmer Tract 2285

** 130 percent of residential or 130 weu

2002* (1/1-12/11/02)	Allocation Year
Total WEU Available	**160.00**
Total WEU Allocated	**48.64**
Residential weu Available	Equivalencies Allocated
69.52 water equivalency units 26 sfr + 2 rollover = 28 units 8 mfr - 0 rollover = 8 units	 28 5.24 (MFR)
Commercial weu (rounded)	Allocated
"A" 65	6.1
"B" 12	9.3
Industrial 13	0

* Updated after first of the year.

2001 (1/1-12/31/01)	Allocation Year
Total WEU Available **Total WEU Allocated**	**160.00** **74.66**
Residential weu Available	Equivalencies Allocated
69.52 water equivalency units 55 sfr + 8 rollover = 63 units 22 mfr - 8 rollover = 14 units	63 6.89 (11 MFR)
Commercial weu (rounded)	Allocated
"A" 65 "B" 12	"A" 4.77 "B" 0
Industrial 13	Industrial 0

2000 (1/1-12/31/00)	Allocation Year
Total WEU Available **Total WEU Allocated**	**160.00** **82.25*** *est. to 12/31
Residential weu Available	Equivalencies Allocated
69.52 water equivalency units 55 sfr + 13 rollover = 68 units 22 mfr - 13 rollover = 9 units	68 4.86
Commercial weu (rounded)	Allocated
"A" 65 "B" 12	"A" 9.39 "B" 0
Industrial 13	Industrial 0

1999 (1/1-12/31/99)	**Allocation Year**
Total WEU Available Total WEU Allocated	160.00 54.38*, ** *est. to 12/3, **0.77 bank
Residential weu Available	Equivalencies Allocated
69.52 water equivalency units 55 sfr units 22 mfr	 53 (53 units) 1.32 (2 units)
Commercial weu (rounded)	Allocated
"A" 65 "B" 12	"A" 0 "B" 0
Industrial 13	Industrial 0.06

1998 (1/1-12/31/98)	**Allocation Year**
Total WEU Available **Total WEU Allocated**	**156.00** **64.48*** *6.48 from Bank
Residential weu Available	Equivalencies Allocated
68 water equivalency units 50 sfr + 12 rollover = 62 units 27 mfr - 12 rollover = 15 units 4 sfr units allocated in previous yrs 2 mf units allocated in 1997 1 mf unit achieved water through on-site RFT	 55 6.48* * from Bank 1.62 to 2nd units outside Ms F
Commercial weu	Allocated
"A" 63 "B" 12	"A" 1.38 "B" 0
Industrial 13	Industrial 0

Year changed to calendar year

1997 (7/1-12/31/97)	Allocation Year
Total WEU Available **Total WEU Allocated**	**153.13** **7.95**
Residential weu Available	Equivalencies Allocated
66.12 weu 45 single family units 32 multi-family units	Residential 7.90 weu 7.00 to SF units .36 to MF .54 to 2nd units outside Ms F
Commercial weu	Allocated
"A" 62.37 "B" 11.71	"A" .05* "B" 0
Industrial 12.93	Industrial 0

*from Bank

1996/97 (7/1/96-6/30/97)	Allocation Year
Total WEU Available **Total WEU Allocated**	**153.13** **88.00**
Residential weu Available	Equivalencies Allocated
66.12 weu 45 single family units 32 multi-family units	Residential 23 weu 23 to SF units 0 to MF units
Commercial weu	Allocated
"A" 62.37 "B" 11.71	"A" 62.37* "B" 2.63*
Industrial 12.93	Industrial 0

*from Bank

*2.43 from Bank

1995/96 (7/1/95-6/30/96)	Allocation Year
Total WEU Available **Total WEU Allocated**	**146.65** **52.83**
Residential weu Available	Equivalencies Allocated
63.74 weu 38 single family units 39 multi-family units	Residential 29.44 weu 29.44 to SF units 0 to MF units
Commercial weu	Allocated
"A" 60.11 "B" 11.29	"A" 19.15 "B" 4.06
Industrial 12.46	Industrial 0.18

1994/95 (7/1/94-6/30/95)	Allocation Year
Total WEU Available **Total WEU Allocated**	**147.60** **29.36**
Residential weu Available	Equivalencies Allocated
63.74 weu 38 single family units 32 multi-family units	Residential 29.36 weu 29 to SF units .36 to MF units
Commercial weu	Allocated
"A" 60.11 "B" 11.29	"A" 0 "B" 0
Industrial 12.46	Industrial 0

1993/94 (7/1/93-6/30/94)	Allocation Year
Total WEU Available	**149.55**
Total WEU Allocated	**54.67**
Residential weu Available	Equivalencies Allocated
64.58 weu 50 single family units 27 multi-family units	Residential 44.56 weu 43 to SF units 1.56 to MF units
Commercial weu	Allocated
"A" 60.90 "B" 11.44	"A" 9.54 "B" .57
Industrial 12.63	Industrial 0

1992/93 (7/1/92-6/30/93)	Allocation Year
Total WEU Available	**149.55**
Total WEU Allocated	**64.75**
Residential weu Available	Equivalencies Allocated
64.58 weu 50 single family units 27 multi-family units	Residential 56.25 weu 46 to SF units 10.25 to MF units
Commercial weu	Allocated
"A" 60.90 "B" 11.44	"A" 0 "B" 8.07
Industrial 12.63	Industrial 0.43

S\Planning\Water\Water Allocation tbls1.xls

TABLE 2

PROJECTED GROWTH RATES VERSUS ACTUAL POPULATION INCREASES

**** There are two entrees for 2000. The first was based on the 1990 census and the second on the 2000 census for comparison.***

Year	Population Per Ord 266/ LCP [1]	Actual Population [2]	Housing Units Per Ord. 266 Projections	Actual No. of Housing Units [3]
1980	9425	9064		5180
1981	9705	9206		5298
1982	9998	9297		5302
1983	10298	9435		5326
1984	10400	9599		5363
1985	10505	9747	5440	5403
1986	10610	9881	5517	5473
1987	10716	9819	5594	5548
1988	10823	9975	5671	5638
1989	10931	10133	5748	5647
1990	11040	9664	5825	5694
1991	11150	9806	5902	5760
1992	11262	9736	5979	5760
1993	11489	9979	6056	5845
1994	11489	10071	6133	5877
1995	11604	9518	6210	5888
1996	11720	9687	6287	5922
1997	11837	9696	6364	5960
1998	11955	9845	6441	6005
1999	12123	9871	6518	6048
2000	12196	9981	6595	6104
2000	12196	10410*	6595	6104
2001	12200[4]	10486	6672[4]	6178
2002	12200[4]	10510	6672[4]	6220
2003	12200[4]	10510	6672[4]	6289
2004	12200[4]	10522	6672[4]	6336
2005	12200[4]	10270	6672[4]	6392
2006	12200[4]	10491	6672[4]	6437
2007	12200[4]	10436	6672[4]	6483
2008	12200[4]	10506	6672[4]	6492
2009	12200[4]	10555	6672[4]	6496

1 This column represents population based on Ordinance 266's projected growth of 77 units per year. These figures indicate that the City's growth rate is behind the Ordinance 266 schedule.

2 Actual population figures are taken from the California Department of Finance "Housing Estimates" report. The 1990 decennial census is the benchmark for the estimates prior to 2000. After 2000 the 2000 decennial census is used and a second entrée for 2000 shows the adjustment for the new census. The figures represent totals as of January 1st of each year indicated. The population figure includes an estimated 21% vacancy rate. A lower vacancy rate would result in a higher population.

3 The total number of Housing units includes the addition of all new residential units to the City's Housing Stock, as well as the deduction of all units lost through demolition, removal, or change of use from residential to non-residential.

4 This is the maximum population or housing under Ordinance 266 without an election to allow further building.

TABLE 3

WATER PRODUCTION DATA 1980 – 2009
(in Acre Feet)

Year	Chorro Basin	Morro Basin	R/O Plant	State Water	Total
1980	1079	672	---	---	1651
1981	1143	584	---	---	1727
1982	1061	526	---	---	1587
1983	995	537	---	---	1532
1984	1097	572	---	---	1669
1985	1108	582	---	---	1690
1986	1059	552	---	---	1611
1987	1124	531	---	---	1655
1988	1120	528	---	---	1648
1989	1047	512	---	---	1559
1990	963	564	---	---	1527
1991	808	449	---	---	1256
1992	1049	270	---	---	1319
1993	994	397	---	---	1391
1994	954	460	---	---	1414
1995	986	420	---	---	1418
1996	1261	240	---	---	1501
1997	985	249	---	301	1535
1998	38	---	---	1288	1326
1999	34	---	---	1359	1393
2000	4	---	---	1396	1400
2001	11	---	---	1399	1410
2002	1	32	48	1373	1454
2003	1	28	13	1379	1421
2004	49	213	10	1205	1477
2005	204	150	0	1007	1361
2006	257	80	25	1009	1371
2007	276	35	19	1116	1446
2008	184	52	28	1175	1439
2009	235	80	64	1069	1448

TABLE 4
TOTAL HISTORIC WATER PRODUCTION & RAINFALL
FOR THE CITY OF MORRO BAY

YEAR	RAINFALL	CITY POPULATION	PRODUCTION IN ACRE FEET	PRODUCTION IN MILLIONS OF GALLONS	AVERAGE DAILY PRODUCTION IN MILLIONS OF GALLONS	AVERAGE USE IN GALLONS PER CAPITA PER DAY
1960	10.48	5599	894	291	0.8	142
1961	8.6		842	274	0.75	
1962	17.22		999	326	0.89	
1963	18.52		840	274	0.75	
1964	11.26		881	287	0.79	
1965	16.08	6,400	1000	326	0.89	140
1966	11.24	6,,500	1188	387	1.06	163
1967	20.09	6,600	1194	389	1.07	161
1968	9.64	6,750	1298	423	1.16	172
1969	28.74	6,900	1255	409	1.12	162
1970	9.84	7,109	1534	500	1.37	193
1971	14.2	7,450	1533	500	1.37	184
1972	7.41	7,517	1547	504	1.38	184
1973	27.51	7,725	1424	464	1.27	165
1974	22.35	7,942	1482	483	1.38	167
1975	14.43	8,165	1510	492	1.35	165
1976	11.38	8,394	1574	513	1.41	167
1977	8.35	8,525	1249	407	1.12	131
1978	29.68	8,625	1430	466	1.28	148
1979	17.06	9,150	1614	526	1.44	157
1980	20.99	9,064	1651	538	1.47	162
1981	13.11	9,206	1727	563	1.54	168
1982	20.01	9,297	1586	517	1.42	152
1983	35.01	9435	1534	500	1.37	145
1984	10.08	9599	1669	544	1.49	155
1985	10.02	9747	1691	551	1.51	155[129]a
1986	17.17	9881	1614	526	1.44	146[120]
1987	12.29	9819	1655	539	1.48	150[127]
1988	15.01	9975	1648	537	1.47	147[124]
1989	10.88	10133	1559	508	1.39	137[118]
1990	8.78	9664	1527	498	1.36	141[115]
1991	16.01	9806	1256	410	1.12	114[92]
1992	19.63	9736	1319	430	1.18	121[98]
1993	24.21	9979	1391	452	1.24	124[98]
1994	11.05	10071	1414	462	1.26	126[106]
1995	40.01	9518	1418	462	1.27	133[110]
1996	15.47	9687	1501	462	1.34	138[110]
1997	18.56	9696	1535	489	1.37	141[115]
1998	18.01	9845	1326	432	1.18	120[102]
1999	13.11	9871	1393	454	1.24	126[108]
2000	19.63	10410	1400	456	1.25	120[103]
2001	16.04	10486	1410	459	1.26	118[107]
2002	9.36	10510	1454	474	1.3	123[108]
2003	13.75	10485	1421	466	1.28	122[108]
2004	9.48	10522	1477	481	1.32	125[105]
2005	30.19	10270	1361	444	1.22	118[106]
2006	18.9	10491	1371	447	1.23	117[104]
2007	7.24	10436	1446	471	1.29	118[109]
2008	13.34	10548	1439	469	1.23	122[111]
2009	12.25	10555	1448	472	1.29	120[107]

a: [average] determined from metered water sold, not water produced