

HILL COUNTRY UNDERGROUND WATER CONSERVATION DISTRICT DROUGHT MANAGEMENT PLAN

Adopted December 14, 2004

Section I. Declaration of Policy, Purpose and Intent

The Hill Country Underground Water Conservation District (HCUWCD) adopts this plan for the purpose of conservation, preservation, protection, recharging and prevention of waste of groundwater in Gillespie County. The adoption of the plan satisfies the requirements of Section 36.1071(a)(6)&(7), Texas Water Code that mandates Groundwater Conservation District to address drought conditions and conservation in its Management Plan.

This plan provides the means to address drought conditions and will be used in conjunction with District Rule 9.3, should the Board of Directors (the Board) declared a Category One Critical Groundwater Depletion Area.

The intent of the plan is to conserve and protect the integrity of the groundwater supply in the District, with particular regard for domestic use, as well as to protect and preserve the public health, welfare and safety and to minimize the adverse impacts of water supply shortages on other beneficial water users during periods of drought conditions. The HCUWCD therefore, adopts the following regulations and restrictions on the production and use of groundwater during designated periods of drought.

Water uses regulated or prohibited under this plan are considered to be non-essential and continuation of such uses during times of water restrictions, as defined herein, are deemed to constitute a waste of water which subjects the offender(s) to penalties as defined in Section X of the plan. Although non-essential use is targeted in the water restrictions outlined in this plan, all permitted wells (public water supply, agricultural, industrial, commercial, institutional and other non exempt wells) are subject to drought restrictions as determined by the degree of drought stage.

Section II. Public Involvement

Opportunity for the public to provide input in to the preparation of the plan was provided by the HCUWCD by means of public meeting and a public hearing.

Section III. Public Education

The HCUWCD will periodically provide the public with information about the plan including information about the conditions under which each stage of the plan is to be initiated, and the drought response measures to be implemented in each stage. This information will be provided either by radio announcements, newspaper articles, public meetings and mailings to non-exempt well owners/operators.

Section IV. Coordination with Local River Authority, Regional Planning Groups and other District Governing Bodies

The HCUWCD includes all of Gillespie County. Gillespie County is within the jurisdictional area of the Lower Colorado River Authority (LCRA) and is within the Lower Colorado Regional Water Planning Area (Region K). The incorporated City of Fredericksburg is within the District as is the Stonewall Water Control and Improvement District. The HCUWCD has provided review copies of the plan to all of the entities listed above, in addition to all other governing entities within Gillespie County.

Section V. Authorization

The Board of Directors of the HCUWCD, or its designee shall implement by proclamation, or terminate, any phase of this plan, based on the measures described in this plan.

Section VI. Application

The provisions of this plan shall apply to all persons or organizations, public or private, having or operating wells utilizing groundwater within the District, regardless of size, capacity, date of drilling or ownership of the wells.

Section VII. Exceptions

The HCUWCD recognizes that the City of Fredericksburg, the Stonewall Water Control and Improvement District, the Harper Well System owned by the LCRA and the CCNs within Gillespie County have developed and utilize their own drought management plans. These will be exempt from the provisions of the plan until the Board of Directors of the HCUWCD declare a Category One Critical Groundwater Depletion Area. Upon such declaration, all permitted wells, including grandfathered wells and all of the wells that had been granted exemptions by the District within the county shall be under the provisions of this plan. The restrictions set forth in Section IX shall not apply to the uses of water to alleviate conditions threatening health, safety, or welfare of the public, the suppression of fires or the watering of landscape using grey water.

Section VIII. Definitions

For the purpose of the plan, the following definitions shall apply.

Aesthetic Water Use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Agricultural Water Use: as defined under Section 36.001(19)(20), Texas Water Code.

CCN: Certificate of Convenience and Necessity.

Commercial and Institutional Water Use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities including but not limited to retail establishments, hotels and motels, restaurants and other buildings.

Conservation: shall mean practices, techniques and technologies that will reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and use of water.

Critical Groundwater Depletion Area (CGWDA): shall mean an area in the District where pumpage has caused a drawdown of the water table or a reduction of artesian pressure to an extent that a mining situation is occurring causing a depletion of the aquifer in the area.

Domestic Water Use: shall mean use of groundwater by an individual or a household to support essential domestic activity. Such essential domestic activity includes water for uses inside the home; for irrigation of lawns, flower beds, shrubs, trees shading the home, or a family garden and/or orchard with manual sprinklers and garden hoses; for watering of domestic animals; for protection of foundations; and for recreation specifically only for swimming pools. Essential domestic activity does not include:

- 1) water used to support activities for which consideration is given or for which the product of the activity is sold;
- 2) the irrigation of lawns or other landscaped areas by sprinkler or other system, whether above ground or below ground, permanent or temporary (other than hand-held hose or single sprinkler attached to a garden hose).
- 3) Pond, lake, tank reservoir, or other confinement which has a capacity greater than 50,000 gallons;
- 4) Non-closed system geothermal heating/cooling systems.

Drought: a meteorological period of serious moisture (precipitation) deficiency, and a resultant reduction in spring flow and stream flow generally accompanied by an increase in demand.

Drought Indices: those indicators selected for the purposes of this plan to initiate (triggers) drought stages: aquifer levels, Palmer Drought Severity Index (PDSI), Palmer Hydrological Drought Index (PHDI), local drought index, Pedernales River flow and rainfall.

Exempt Well: a well used for domestic (see definition) or livestock use.

Industrial Water Use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape Irrigation Use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, athletic fields, golf courses, and right-of-ways and medians.

Local Drought Index: those local indicators selected, to be used in conjunction with the Palmer Drought Indices, for the purpose to initiate or trigger drought stages that are identified in this plan.

Non-Essential Water Use: water uses that are not essential nor required for the protection of public health safety, and welfare, including:

- 1) Irrigation of lawn or landscape areas, including parks, athletic fields, and golf courses;
- 2) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or any other mobile vehicles;
- 3) Use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hand-surface areas;
- 4) Use of water to wash down buildings or structures for the purposes other than immediate fire protection;
- 5) Flushing gutters or permitting water to run or accumulate in any gutter, ditch or roadway;
- 6) Use of water to fill, refill, or add to any indoor or outdoor swimming pools or jacuzzi type pools;
- 7) Use of water in a fountain, pond or stock tank for aesthetic or scenic purposes;
- 8) Failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leaks; and
- 9) Use of water from hydrants for construction purposes or any other purposes other than fire fighting and flushing of lines to maintain a portable water supply.

Non-Exempt Well: a well requiring a permit from the District

Permitted Well: shall mean a well subject to the District's drilling/operation permit requirements, which is not otherwise exempted from permitting by District Rules.

Public Water System: as defined under 30 TAC Subchapter D, Paragraph 290.38(41).

Registered Well: shall mean and include any artificial excavation to produce groundwater that does not otherwise require a Permit by District Rules.

Waste of Water: as defined in District Rule definitions 1.1 and inclusive of use of groundwater for non-essential purposes as defined herein during drought stages where such use is prohibited as specified by this plan.

Section IX. Triggering Criteria for Initiation and Termination of Drought Stages

The Board of Director of the HCUWCD or its designee shall monitor the indices and shall determine when conditions warrant initiation or termination of each stage of the plan. The plan is divided into 5 drought stages; mild, moderate, severe, critical and emergency.

(a) Drought Trigger Indices

The HCUWCD has developed a method for calculating a local drought index based on the Palmer Drought Index and local conditions that are sensitive to drought. The local parameters are:

- Daily averaged water levels from two City of Fredericksburg Ellenburger monitor wells.
- Daily averaged flow from the Pedernales River from a site south of Fredericksburg.
- The prior 10 month cumulative rainfall amounts as recorded by the City of Fredericksburg at Lady Bird Johnson Municipal Park.

The water levels and river flow are real time data and can be accessed at the Texas Water Development Board's (TWDB) and LCRA's web site. A ten month cumulative rainfall total was selected due to the results from another study which indicated a correlation between a ten month rainfall lag and water level response in the Ellenburger aquifer.

Using these local parameters as independent variables, and either the Palmer Drought Severity Index, or Palmer Hydrological Drought Index as the dependent variable in a multiple regression analysis, a local drought index can be derived. A formula is generated from which the daily averaged water levels, daily averaged stream flow and rainfall values can be inputted, resulting in the generation of the daily local drought index.

The formula derived from the regression analysis performed on the local parameters dating back to January 2000 is as follows:

$$\text{Local Drought Index} = -Y \text{ intercept} + \text{Hahn \#1 TW Avg. Water Levels} \times (\text{Water Level Regression Coefficient}) - \text{Knauth \#1 Avg. Water Levels} \times (\text{Water Level Regression Coefficient}) + \text{River Flow} \times (\text{River Flow Regression Coefficient}) + 10 \text{ Month Rainfall} \times (\text{10 Month Rainfall Regression Coefficient})$$

The actual regression coefficient values used in the formulas are not provided here since they change when the regression analysis is rerun using recent local data. By continually updating the database and rerunning the analysis, a more accurate formula is obtained based on the additional new data. Therefore the development of the local index is an ongoing process.

The local drought indices obtained from the above formulas are used as trigger conditions for the initiation of drought stages as shown by the following:

<u>Local Drought Index</u>	<u>Drought Stage</u>
-1	Stage 1 – Mild
-2	Stage 2 – Moderate
-3	Stage 3 – Severe
-4	Stage 4 – Critical
-5	Stage 5 – Emergency

(b) Initiation, Response and Termination of Drought Stages.

The Board of Directors of the HCUWCD or its designee shall monitor the defined drought indices and shall determine when conditions warrant initiation or termination of each stage of the plan. Public notification by the District of the initiation or termination shall be by means of either notification in a newspaper of general circulation, radio announcement, or district mailing or email to owners/operators of permitted wells.

This plan is applicable to all permitted wells in Gillespie County, inclusive of all grandfathered wells and wells previously exempted by the District after the District declares a Category One Critical Groundwater Depletion Area designation (Rule 9.3). Wells exempted from District Production Rules by Chapter 36 of the Texas Water Code are exempt. However the District encourages voluntary compliance during each drought stage, and all well owners should strive to meet the water production reductions that are set at each drought stage.

The water reduction goals assigned to each drought stage are voluntary for permitted wells until the District declares a Category One Critical Groundwater Depletion Area (CGWDA), thereafter the water reduction amounts become mandatory on all permitted wells, inclusive of grandfathered permitted wells and wells previously exempted by the District. The Board of Directors of the District may declare a Category One Critical Groundwater Depletion Area during Stage 2 through 4, but shall make that designation upon entering into drought Stage 5.

This plan focuses on a fractional reduction in water demand on permitted wells under each stage. It will be at the discretion of the well owner as to how the requirements for the reduction in water production are met. For those permitted wells that supply water to public water supply systems, in the Appendix are drought stage restrictions that should be followed or, the public water supply system's own drought management plan which should be as stringent or more stringent than this plan.

Stage 1 - Mild Drought

Trigger Condition – Local Drought Index falls between –1.0 to –1.9

Water Reduction – 5 % reduction in average daily water demand, 10% reduction in maximum daily water demand.

Requirements for Termination – Local Drought Index increases above –1.0

Stage 2 - Moderate Drought

Trigger Condition – Local Drought Index falls between –2.0 to –2.9

Water Reduction – 10% reduction in average daily water demands, 20% reduction in maximum daily water demand.

Other Requirements – The Board of Directors may elect to declare a Category One Critical Groundwater Depletion Area.

Requirements for Termination – Local Drought Index increases above –2.0

Stage 3 - Severe Drought

Trigger Condition – Local Drought Index falls between –3.0 to –3.9

Water Reduction – 15% reduction in average daily water demands, 25% reduction in maximum daily water demand.

Other Requirements – The Board of Directors may elect to declare a Category One Critical Groundwater Depletion Area.

Requirements for Termination – Local Drought Index increases above –3.0

Stage 4 - Critical Drought

Trigger Condition – Local Drought Index falls between –4.0 to –4.9

Water Reduction – 20% reduction in average daily water demands, 40% reduction in maximum daily water demand.

Other Requirements – The Board of Directors may elect to declare a Category One Critical Groundwater Depletion Area and depending upon aquifer conditions may require additional water reductions on production.

Requirements for Termination – Local Drought Index increases above –4.0

Stage 5 - Emergency Drought

Trigger Condition – Local Drought Index falls below -5.0

Water Reduction – 30% reduction in average daily water demands, 50% reduction in maximum daily water demand.

Other Requirements – The Board of Directors shall declare a Category One Critical Groundwater Depletion Area and depending upon aquifer conditions require additional water reductions on production and monthly production levels on permitted wells be reported to the District.

Requirements for Termination – Local Drought Index increases above –5.0

Section X – Enforcement

The District shall enforce any violations of the provisions in this plan through District Rule 11.3.

Section XI Variances

The Board of Directors of the HCUWCD or its designee may, in writing grant variances for existing water uses otherwise prohibited under this plan. Variances will be granted if it is determined that failure to grant such a variance would result in an emergency condition adversely affecting the public health or sanitation. A variance may be granted for reasons of economic hardships provided the hardship threatens an individual's or business's sole source of income.

The request for a variance must be in writing and filed with the District. Variances granted by the District shall be in writing and issued within five (5) working days after receipt of request. Until the District has acted on the request, the applicant must comply with all provisions of this plan.

A variance expires under any terms and conditions imposed by the District or when another stage of the plan is in effect. A separate application for a variance must be submitted at each stage, unless a single variance is granted with separate conditions applicable to separate stages. Any violations of the terms and conditions of the variance may revoke any variance previously granted. The District will notify the applicant and allow the applicant an opportunity to be heard by the District before it takes action.

APPENDIX

Water Restriction Guidelines for Public Water Supply Systems

Stage 1 - Mild Drought

Trigger Condition – Local Drought Index falls between –1.0 to –1.9

Water Reduction – 5 % reduction in average daily water demand
10% reduction in maximum daily water demand

Requirements – Mandatory requirements between the months of June through September, include limiting outdoor irrigation by hose-end sprinklers, automatic sprinklers, soaker hoses, or drip irrigation between the hours of 6:00 p.m. to 10 a.m. of the following day. Voluntary requirements include following the above outdoor use during the months of October through May.

Requirements for Termination – Local drought index increases above –1.0

Stage 2 - Moderate Drought

Trigger Condition – Local Drought Index falls between –2.0 to –2.9

Water Reduction – 10% reduction in average daily water demands
20% reduction in maximum daily water demand

Requirements – All requirements in Stage 1 shall remain in effect and mandatory. In addition the following shall also supply:

- 1) All outdoor irrigation by hose-end sprinklers, automatic sprinklers, soaker hoses or drip irrigation may occur only between the hours of 6:00 p.m. to 10:00 a.m. of the following day on designated watering days.
- 2) If a new landscape has been installed within two weeks or after the initiation of Stage 2, then irrigation of that landscape may only occur during the outdoor watering hours listed immediately above and in accordance with the following 30 day schedule:
 - 1) For the first 10 days after installation, once a day;
 - 2) For day 11 through 20 after installation, once every other day; and
 - 3) For day 21 through 30 after installation, once every third day.
- 3) The washing of automobiles, trucks, boats, airplanes, and other types of mobile equipment is prohibited except between the hours of 6:00 p.m. to 10:00 a.m. of the following day. The washing, when allowed, must be done with a hand-held bucket or hand-held hose equipped with a positive shutoff nozzle for quick rinse. This restriction does not apply to the washing of vehicles or mobile equipment when conducted at a commercial carwash or

service station. Nor does it apply to the washing of mobile equipment when washing is necessary to protect the health, safety and welfare of the public. Charity carwashes are prohibited.

- 4) Use of water to fill, refill, or add to any indoor or outdoor swimming pools, wading pools, or jacuzzi-type pools is prohibited except on designated watering days during the designated watering hours.
- 5) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a re-circulation system.
- 6) Use of water from hydrants shall be limited to fire fighting, relating activities, or other activities necessary to maintain public health, safety, and welfare, except that use of water from designated fire hydrants for construction purposes may be allowed under special permit.
- 7) Irrigation of a golf course fairway is prohibited except on a designated outdoor water use day between the hours 6:00 p.m. and 10 a.m. of the following day. Irrigation of a golf course green or tee is allowed every other day if a plan is filed and approved. These restrictions do not apply if the golf course utilizes an alternate water supply as its only irrigation source, such as reclaimed water, rainwater or graywater.
- 8) All restaurants are encouraged to serve water to their patrons only upon request.

Requirements for Termination – Local Drought Index increases above –2.0

Stage 3 - Severe Drought

Trigger Condition – Local Drought Index falls between –3.0 to –3.9

Water Reduction – 15% reduction in average daily water demands
25% reduction in maximum daily water demand.

Requirements – All requirements of previous stages shall remain in effect during Stage 3. In addition one or more of the following shall be implemented:

- 1) Out door watering shall only be allowed during the outlined above times, but only done so no more than once a week.
- 2) The use of water for washing sidewalks, driveways, parking areas, streets, tennis courts, or other paved impermeable areas, except to alleviate health or fire hazard is prohibited.
- 3) The watering of the ground around foundation to prevent foundation cracking is permitted only during times designated for landscape irrigation, unless watering is accomplished by a drip system or a hand-held hose, then foundation watering may be done at any time.

Requirements for Termination – Local Drought Index increases above –3.0

Stage 4 - Critical Drought

Trigger Condition – Local Drought Index falls between –4.0 to –4.9

Water Reduction – 20% reduction in average daily water demands
40% reduction in maximum daily water demand.

Requirements – All requirements of Stage 3 shall remain in effect during Stage 4. In addition one or more of the following shall be implemented:

- 1) Irrigation of landscaped areas shall be limited to once a week on the above-designated schedules, and shall be by means of hand-held hoses or hand-held buckets only. No hose-end sprinklers or automatic sprinklers are allowed at any time.
- 2) All washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment is prohibited at all times unless it is on the premises of a commercial car wash or service station. The washing of mobile equipment shall occur during the times when landscaped irrigation is allowed.
- 3) The filling or refilling of water is privately owned swimming, including jacuzzi-type pools is prohibited. Water may be added to pools to replace water lost due to use or evaporation during times when landscape irrigation is allowed.
- 4) The watering of golf courses is prohibited unless the golf course utilizes treated wastewater effluent.
- 5) Bulk sales of water for purposes other than potable consumption and sanitation are prohibited.

If the above actions do not achieve the water reductions or if Stage 4 trigger conditions continue to persist, then a water-rationing program may be implemented. The rationing program could contain specific reduction amounts for each household connection as given by the following example:

(a) Single Family Residence

<u>Persons Per Household</u>	<u>Gallons Per Month</u>
1 to 2	2,000
3 to 4	4,000
5 to 6	6,000
7 to 8	8,000
9 to 10	10,000
11 or more	12,000

(b) Master-Metered Multi-Family Residence
2,000 gallons per month for each dwelling

(c) Commercial & Industrial Users

Limited to 75% of customer usage for corresponding month's billing period for the previous 12 months.

In addition or as an alternative to the above water rationing action, water surcharges could be applied for usage over allocated amounts, as shown by the following examples:

\$x for the first 1,000 gallons over allocation

\$x + \$1.00 for the second 1,000 gallons over allocation

\$x + \$2.00 for the third 1,000 gallons over allocation

\$x + \$3.50 for each additional 1,000 gallons over allocation

Note: Surcharges shall be cumulative

Requirements for Termination – Local Drought Index increases above –4.0

Stage 5 - Emergency Drought

Trigger Condition – Local Drought Index falls below -5.0

Water Reduction – 30% reduction in average daily water demands
50% reduction in maximum daily water demand.

Requirements – All requirements of Stage 4 shall remain in effect during Stage 5. In addition one or more of the following shall be implemented:

- 1) Irrigation of landscape areas is prohibited at all times.
- 2) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane, or any other mobile vehicle is prohibited at all times.
- 3) The filling, refilling, or adding of potable water to private swimming, or jacuzzi-type pools is prohibited.
- 4) No additional, expanded or increase-in-size water service connections, meters, service lines, pipeline extensions, mains or water service facilities of any kind shall be allowed or approved.
- 5) In the event of system failure, the water supply will be managed by such measures necessary to maintain public health and safety, including elimination of service to part or all of the water system.

Requirements for Termination – Local Drought Index increases above –5.0