AGENDA ITEM NO.

COUNTY OF HUMBOLDT

For the meeting of: February 24, 2015

Date: February 9, 2015

To: Board of Supervisors

From: Thomas K. Mattson, Public Works Director

Subject: Analysis and Response to the Sustainable Groundwater Management Act

RECOMMENDATION(S):
That the Board of Supervisors:

1. Receives a staff report and comments from the interested public regarding the Sustainable Groundwater Management Act;
2. Provides guidance on the County's response to the Sustainable Groundwater Management Act including department roles, funding, and engaging with stakeholders;
3. Directs Public Works to convene a workshop for stakeholders on the Sustainable Groundwater Management Act in April 2015 and return to the Board with a summary of stakeholder feedback; and
4. Authorizes staff to apply for funds from the grant program to be established for groundwater planning in late 2015/early 2016 by the state Department of Water Resources in response to Proposition 1.

SOURCE OF FUNDING: General Fund

DISCUSSION:
This staff report provides an analysis of the groundwater legislation signed by Governor Brown

Prepared by Hank Seemann, Deputy-Director CAO Approval _____

REVIEW:
Auditor _____ County Counsel _____ Human Resources _____ Other _____

TYPE OF ITEM:
_____ Consent
_____ Departmental
_____ Public Hearing
___X___ Other ___**Time-set 9:30 am**___

PREVIOUS ACTION/REFERRAL:

Board Order No. _____

Meeting of: _____

BOARD OF SUPERVISORS, COUNTY OF HUMBOLDT
Upon motion of Supervisor Seconded by Supervisor

Ayes
Nays
Abstain
Absent

and carried by those members present, the Board hereby approves the recommended action contained in this Board report.

Dated: _____
By: _____
Kathy Hayes, Clerk of the Board

in September 2014 and identifies issues to be addressed as the County and affected stakeholders start discussing how to respond.

Background

The term "groundwater" refers to water that occurs beneath the land surface in saturated layers of sediment deposits or fractured rock. While groundwater is primarily recharged by precipitation infiltrating through the soil, groundwater and surface water are directly linked in the hydrologic cycle. Typically, groundwater discharges to streams during dry conditions, but the direction of flow is reversed under wet conditions (during floods) when streams contribute to groundwater recharge. Groundwater conditions range considerably based on geology, topography, climate, precipitation levels, and land use.

Groundwater is an important natural resource utilized as water supply for residential, irrigation, public supply, and industrial purposes. Many ranchers and dairy producers have wells to pump groundwater for pasture irrigation. The Humboldt Bay Municipal Water District extracts water from gravel and sand beds beneath the Mad River to provide wholesale water to three cities (Arcata, Eureka, Blue Lake) and four community service districts (Fieldbrook-Glendale, Humboldt, Manila, McKinleyville). The Humboldt Community Services District uses a combination of wholesale water and groundwater extracted from three wells. The City of Fortuna relies solely on groundwater wells to provide its water supply. Del Oro Water Company is an investor-owned public utility company that provides water to the City of Ferndale and surrounding area. Many community services districts, tribes, water mutual associations, and individual residences utilize groundwater wells. Landowners are required to obtain a well installation permit from the Environmental Health division of the Department of Health and Human Services, but groundwater extraction within the County is currently unregulated.

Legislation

Laws and regulations in California have largely treated groundwater and surface water separately. The State Water Resources Control Board (State Water Board) has jurisdiction for extraction of surface water, but prior to 2014 there was no comprehensive state framework for regulating and managing groundwater. In September 2014, Governor Brown signed the Sustainable Groundwater Management Act (Groundwater Act), which integrated several bills developed in the legislature over the last few years. The Groundwater Act was given priority in part as a response to the ongoing state-wide drought, and also in an effort to avoid problems and conflicts that have arisen elsewhere in the state. For example, some groundwater basins elsewhere in the state have experienced overdraft, where the water withdrawn by pumping exceeds the amount of recharge over an extended period of time. Some groundwater basins have been subject to court adjudication to settle disputes and determine how much groundwater can be extracted by the affected parties. A summary of the Groundwater Act is provided in Attachment 1.

The Groundwater Act included a policy statement which expresses the Act's overall intent:

> *It is the policy of the state that groundwater resources be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses. Sustainable groundwater management is best achieved locally through the development, implementation, and updating of plans and programs based on the best available science. (Water Code 113)*

The Groundwater Act is based on designated alluvial groundwater basins (Attachment 2), which are areas where usable groundwater is present within sediment deposits associated with the floodplain or delta of rivers and streams. The state Department of Water Resources (DWR) has designated groundwater basins in a document entitled California's Groundwater (Bulletin 118). The Groundwater Act does not address groundwater outside alluvial basin boundaries.

DWR has designated four priority levels (high, medium, low, very-low) for groundwater basins throughout the state based on eight criteria developed to rank their relative importance as a water supply source. DWR's initial prioritization designated one medium-priority basin in Humboldt County (Eel River Valley) and no high-priority basins (Attachment 3). All other basins in the County are designated very-low priority. A high or medium priority simply indicates that a basin has regional or statewide importance for water supply, and does not imply an overdraft condition or an imminent threat of overdraft. Similarly, a low or very-low priority does not imply a low risk for overdraft, nor does it diminish the basin's local importance. The Groundwater Act contains specific requirements for high- and medium-priority basins, while actions for low- and very-low priority basins are voluntary.

The Groundwater Act is intended to support local management and use of groundwater in a manner that can be maintained without causing undesirable results. Undesirable results include:

1. Lowering of groundwater levels and depletion of supply;
2. Reduction of groundwater storage;
3. Seawater intrusion;
4. Degraded water quality;
5. Land subsidence; and
6. Depletions of interconnected surface waters with adverse impacts on beneficial uses of the surface water.

For high- and medium-priority basins, the Groundwater Act requires a groundwater sustainability plan containing measures to ensure that the basin is operated within its sustainable yield. Sustainable yield is defined as the maximum quantity of water, calculated over a base period representative of long-term conditions, that can be withdrawn annually without causing an undesirable result. Groundwater sustainability plans are required to include background technical information, measurable objectives, and monitoring and management components.

The Groundwater Act requires designation and establishment of a groundwater sustainability agency to implement the Act for each high- and medium-priority basin. Any local agency or combination of local agencies overlying a groundwater basin may elect to be a groundwater sustainability agency for that basin. If no agency steps forward to become the groundwater sustainability agency, then the county is presumed to serve that role. If the county declines, then the role reverts to the State Water Board.

The Groundwater Act gives groundwater sustainability agencies several powers and authorities to implement the Act. Agencies have the discretion to elect whether or not to exercise these powers and authorities. The Groundwater Act gives agencies the powers and authorities to require fees, measuring devices, inspections, reporting, well spacing, and extraction limits.

These powers and authorities may not need to be exercised if the sustainability goal is otherwise achieved and demonstrated with adequate supporting data.

The Groundwater Act specifies that the groundwater sustainability agency shall establish and maintain a list of persons interested in receiving notice of local actions related to the Act. In addition, the Groundwater Act specifies that the groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater, including: holders of overlying groundwater rights; municipal well operators; public water systems; local land use planning agencies; environmental users of groundwater; surface water users, if there is a hydrologic connection between surface and groundwater bodies; the federal government (if it manages land in the basin); tribes; disadvantaged communities; and designated groundwater monitoring entities.

As an alternative to a groundwater sustainability plan, the Groundwater Act contains provisions allowing a local agency to submit a report prepared by a registered professional engineer or licensed geologist analyzing basin conditions and demonstrating that the basin has operated within its sustainable yield over a period of at least 10 years.

According to the Groundwater Act, the state's role is to provide technical assistance, evaluate groundwater sustainability plans for conformance with the Act, and intervene if necessary to remedy deficiencies.

Timeline

- Late 2015/early 2016: DWR to develop grant guidelines and solicit applications for funding to perform groundwater planning as authorized by Proposition 1.

- June 1, 2016: DWR to adopt regulations for implementing the Groundwater Act.

- January 1, 2017: Due date for alternative submittals.

- June 30, 2017: Groundwater sustainability agencies shall be established for all high- and medium-priority basins.

- January 31, 2022: Groundwater sustainability plans shall be adopted for high- and medium-priority basins not in critical overdraft.

- 2042: Deadline for groundwater sustainability goal to be achieved.

Initial Stakeholder Input

In the Fall of 2014, Public Works interviewed ten individuals with interest in local groundwater issues to solicit input on the new legislation. The results of these discussions are summarized in Attachment 4. Public Works also briefed the Fortuna city engineer (January 5, 2015); Humboldt County Fish and Game Advisory Committee (January 20, 2015), and Humboldt County Farm Bureau (February 5, 2015).

Analysis Summary

The following points summarize Public Works' analysis of the Groundwater Act and its applicability to the County:

1. Limited Applicability. The Groundwater Act provides an overall framework for managing and regulating groundwater with a focus on protecting reliable water supplies. In the initial phase of implementation, the Act only applies to the Eel River Valley groundwater basin. Priority levels for groundwater basins in the County could change in the future based on extraction levels, drought conditions, and/or new data.

2. Local Control. The Groundwater Act emphasizes local control and provides the opportunity to develop community-based solutions that protect beneficial uses and avoid conflicts. However, the State Water Board is authorized to intervene in order to remedy deficiencies.

3. Discretionary Powers and Authorities. The groundwater sustainability agency is allowed, but not mandated, to exercise powers and authorities such as requiring meters, limiting extraction rates, and imposing fees.

4. Data and Information Gaps. The concept of sustainable yield is a reasonable basis for managing a groundwater basin. However, existing data and information on groundwater levels, groundwater use, and groundwater/surface water interactions are limited. Public Works is not aware of existing water budgets for any of the groundwater basins in the County. (Water budgets quantify recharge, extraction, discharge, and storage at the basin scale.)

5. Cost Burden. The Groundwater Act does not convey funding for local agencies to implement the Act requirements. DWR will be developing a groundwater planning grant program in late 2015/early 2016 with funds from Proposition 1 (2014 Water Bond; Funding for Water Quality, Supply, Treatment, and Storage Projects). A portion of the costs for implementing the Act can likely be covered through a Proposition 1 grant, if awarded by DWR.

6. Reasonable Timeline. Assuming adequate funding, the timeline for organizing a groundwater sustainability agency for the Eel River Valley groundwater basin and developing a groundwater sustainability plan does not appear unrealistic.

California Statewide Groundwater Elevation Monitoring Program

On March 11, 2014, the Board agreed to serve as the designated monitoring entity for groundwater basins within the County as required under the California Statewide Groundwater Elevation Monitoring (CASGEM) program. Similar to the Groundwater Act, the CASGEM program applies only to high- and medium-priority basins. DWR currently performs semiannual monitoring on seven wells within the Eel River Valley and the data meet the CASGEM requirements. Public Works has served an administrative role to develop a monitoring plan and make the required submittals; the costs for these efforts have been absorbed under the Water Management (251) and Natural Resources Planning (289) budget units.

Overview of Eel River Valley Groundwater Basin
Information developed by DWR in 2004 for Bulletin 118 regarding the Eel River Valley groundwater basin is contained in Attachment 5. Public water suppliers utilizing groundwater within this basin include City of Fortuna, Riverside Community Services District, Patrick Creek Community Services District, Hydesville Community Services District, and Del Oro Water Company. The City of Rio Dell and Scotia Community Services District obtain surface water from the Eel River.

Existing Groundwater Management Functions
The County does not have an existing groundwater ordinance or groundwater management program. Three departments have roles related to the Groundwater Act:

- The Environmental Health Division of the Department of Health and Human Services administers the County's well permit program and provides oversight for certain subsurface contamination sites.
- The Environmental Services Division of Public Works implements the County's role as the monitoring entity for the state CASGEM program.
- The Planning and Building Department implements the County's role as land use authority and develops a variety of state-mandated plans. The Water Resources element of the General Plan contains county-wide policies regarding groundwater.

In addition, the Agricultural Commissioner, UC-Cooperative Extension, and Humboldt County Resource Conservation District have strong connections with the agricultural community. State agencies with interests in groundwater include DWR, State Water Board, North Coast Regional Water Quality Control Board, and Department of Fish and Wildlife.

Key Questions
Key questions related to how the County and affected stakeholders respond to the Groundwater Act include the following:

1. Who are the stakeholders? How should stakeholders be engaged?
2. What are the key issues and concerns? Are there existing or imminent problems?
3. What data exist? What are the important data gaps?
4. Should anything be done for low-priority basins or non-alluvial groundwater?
5. Who should be the groundwater sustainability agency?
6. What should be the roles of the County departments? How will groundwater management integrate with existing functions?
7. How will groundwater management be funded?

Public Works proposes to convene a workshop for stakeholders on the Groundwater Act in April 2015 and return to the Board with a summary of stakeholder feedback from this workshop.

FINANCIAL IMPACT:
The state's Groundwater Act is expected to have a financial impact to the General Fund, however the magnitude and timeframe of this impact are unknown.

The Water Management budget unit (251) in Public Works receives allocations from the General Fund which are primarily intended to fund management and maintenance of County levees and compliance with state municipal stormwater permitting requirements. The current budget allocation does not have capacity to absorb the costs of implementing the Groundwater Act.

The requested action will advance two of the County's core roles (enforce laws and regulations to protect residents, create opportunities for improved safety and health). In addition, the Board's priorities for new initiatives include managing our resources to ensure sustainability of services; seeking outside funding sources to benefit Humboldt County needs; facilitating public/private partnerships to solve problems; and building interjurisdictional and regional cooperation.

OTHER AGENCY INVOLVEMENT:
Department of Health and Human Services (Environmental Health); Planning and Building Department; Agricultural Commissioner; UC-Cooperative Extension; Humboldt County Resource Conservation District; DWR; State Water Board; North Coast Regional Water Quality Control Board; Department of Fish and Wildlife

ALTERNATIVES TO STAFF RECOMMENDATIONS:
Board discretion

ATTACHMENTS:
1 Groundwater Legislation Implementation Fact Sheet
2 Map of Designated Alluvial Groundwater Basins in Humboldt County
3 CASGEM Groundwater Basin Prioritization (Northern Region)
4 Summary of Initial Stakeholder Input
5 Summary of Eel River Valley Groundwater Basin

Attachment 1

Groundwater Legislation Implementation Fact Sheet

Groundwater Legislation Implementation
Fact Sheet

Topline Message

- **Groundwater Legislation**: On September 16, 2014, Governor Edmund G. Brown Jr. signed three bills --- AB 1739 by Assemblymember Roger Dickinson and SB 1168 and SB 1319 by Senator Fran Pavley --- which create a framework for sustainable, local groundwater management for the first time in California history. The legislation allows local agencies to tailor groundwater sustainability plans to their regional economic and environmental needs.

- **Two key principles to the groundwater legislation**:
  - Groundwater is best managed at the local or regional level, and local agencies should have the tools they need to sustainably manage their resources. Some local and regional agencies do not have the necessary tools to be successful. The legislation ensures that local and regional agencies have the resources they need to sustainably manage groundwater, including the necessary authority, better technical information and financial resources.

  - When local or regional agencies cannot or will not manage their groundwater sustainably, the state will intervene until the local agencies develop and implement sustainable groundwater management plans. This limited state intervention would be temporary – until an adequate local program is established – to ensure the protection of the groundwater basin and its users from overdraft, subsidence and other problems stemming from unsustainable uses of groundwater resources.

- **California Water Action Plan**: In January 2014 the Brown Administration released the California Water Action Plan to put California on the path to sustainable water management. Groundwater management is an important piece of the California Water Action Plan.

- **Drought**: The drought and drought response continue to be a top priority for the Brown Administration. As the administration works on emergency actions to manage the immediate crisis, it is also taking proactive, long-term steps to prepare California for future droughts and floods. The

current drought reminds us of how important groundwater is for many Californians, because times of drought are precisely when pumping groundwater is necessary. Therefore, it is crucial that these groundwater basins are properly managed and allowed to recharge.

- **Water Bond**: Proposition 1 is a general obligation bond in the amount of $7.545 billion. It includes funding for ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection.

  The planning and coordination for the water bond implementation will be part of the larger effort to build the Governor's January 10 budget. The agencies, departments, conservancies and boards that have been allocated bond funds will all work with the Department of Finance through the normal budget process and use the California Water Action Plan as a long-term guide for expenditure priorities.

- **Water Bond Funds for Groundwater**: Proposition 1 provides $100 million for sustainable groundwater management planning and implementation for local groundwater sustainable agencies. The bond also provides billions more for groundwater cleanup, storage projects and other actions that will help local agencies manage groundwater sustainably.

- **Groundwater is a critical element of our water supply in California**. It makes up more than one-third of our water supply in wet years and more than half of our water supply in dry years. Groundwater basins provide cost-effective local storage for water supplies that, if well managed, will make communities more resilient against climate change and future droughts.

- **The state's water management system is unsustainable**. The system is unable to reliably meet human, economic and ecological needs. Currently, where groundwater is managed, it is managed by local and regional agencies, some of which manage their resources sustainably. Other regions do not manage sustainably, resulting in problems such as groundwater overdraft, land subsidence, dry wells, increased pumping cost and deteriorated water quality.

Summary of Groundwater Legislation

1. Adopts a state definition of "sustainable groundwater management"
2. Empowers local agencies to achieve sustainability
3. Establishes a uniform framework for local groundwater management planning
4. Respects regional differences and provides local agencies flexibility to tailor plans that meet their needs
5. Provides state technical assistance
6. Improves coordination between land use and groundwater planning
7. Provides for state review of groundwater plans and limited state intervention authority when local action has been insufficient
8. Protects water rights

Core Principles

- **Groundwater should be locally and collaboratively managed to address unique basin conditions and challenges.** Every basin is different, and solutions must be tailored to the basin and its users. Over time, local residents will largely pay for and benefit from the construction, operation and maintenance of improvements to their water resources. Consequently, it is essential that local and regional agencies exercise leadership and obtain consensus on the solutions to their groundwater problems.

- **Groundwater should be managed sustainably.** The goal in all regions of the state must be to manage groundwater sustainably. It is not acceptable for a region to deplete or degrade its groundwater resources to the detriment of future generations.

- **The state's role should complement and support the goal of local sustainable groundwater management.** The state should support local control of sustainable groundwater management by providing the necessary authority, technical support and financial resource options. The state should step in only when local agencies are unable or unwilling to solve serious groundwater problems. When the state does so, however, it should transfer management back to local authorities when they are prepared to assume responsibility.

- **Water rights should be protected.** The water rights of existing water right holders should be reassured that their rights are protected by law. The goal is better groundwater management, which makes those rights more valuable.

Background

- **Groundwater is essential to California.** Because of California's variable precipitation and regular dry periods, California has always relied on groundwater, particularly when surface water is scarce.

    - More than 80 percent of Californians rely, in part, on groundwater for their drinking water.

    - Groundwater is about 38 percent of the state's total annual water supply— up to 60 percent in dry years.

    - Rural areas and small urban areas rely entirely on groundwater, as well as some larger cities, such as Fresno.

    - Groundwater basins are one of the most cost-effective and environmentally friendly places to store water locally during wet years.

    - Collectively, groundwater basins are the state's largest reservoirs— more than 10 times the size of all its surface reservoirs combined.

    - If managed well, groundwater can serve as a buffer against the impacts of climate change and drought.

- **Groundwater and surface water are part of the same system.** Groundwater feeds surface water streams when groundwater levels are high. When groundwater levels decline, groundwater contributions to stream flow may decline or surface streams may lose more water to the aquifer than under natural conditions. Some streams may become completely disconnected from groundwater, entirely losing contributions from groundwater inflow.

- **Groundwater problems vary greatly and are locally very important.**

    - Overdraft is a problem in large parts of the San Joaquin Valley, as well as some Central Coast and southern California basins with limited surface supplies.

    - Between 2006 and 2010, the Central Valley lost enough groundwater to fill our largest reservoir, Lake Shasta, five times.

    - Seawater intrusion into aquifers is a problem in some coastal areas, such as the Oxnard plain and parts of Monterey County.

    - Groundwater pumping is dewatering rivers that supply surface water to communities and farms, and support salmon and other important species.

Q&A

Q. What does "sustainable" mean?

A. Simply put, sustainable groundwater management means managing our precious water so that it is available for future generations, while balancing the more immediate needs of our economy, environment and essential human health and safety.

Q: Many areas already manage their groundwater sustainably. Does the legislation impose new mandates on them?

A: One of the law's core principles is that groundwater should be managed at the local and regional level. There are many examples where local management has proven successful and state management is not needed. As long as local or regional agencies are demonstrably managing their groundwater in sustainable fashion, state management is unnecessary. The state's role is then limited to support and monitor the success of local or regional management agencies.

Q. How does the groundwater legislation relate to the drought?

A. Sustainable groundwater management is an issue that goes beyond the current drought. Improved groundwater management will put us in a better position to recharge our groundwater basins in future wet years and will make communities more resilient to climate change and future droughts. The drought has highlighted groundwater's importance in California's overall water supply, as well as the vulnerability of the resource. This drought has led to an increased demand for groundwater and is expected to worsen overdraft in some areas. The problem is not new, however, and overdraft has been occurring in some basins for decades.

Q. What is overdraft?

A. A basin is in overdraft when the amount of groundwater pumped from the basin exceeds the amount of water recharging the basin over a period of time. When overdraft continues for a number of years, significant impacts may occur, including land subsidence, water quality degradation, dry wells, seawater intrusion and increased extractions costs.

Q. What is long-term overdraft?

A. Long-term overdraft means the condition of a groundwater basin where the average annual amount of water extracted for a long-term period, generally 10 years or more, exceeds the long-term average annual supply of water to the basin, plus any temporary surplus.

Q. How is limited state intervention consistent with local control?

A. First and foremost, groundwater should be managed at the local and regional level. This new law ensures that local and regional agencies have the tools they need to sustainably manage their groundwater resources. Locally derived solutions are often the most successful because they can best account for local conditions and needs, but some local areas have found it difficult to solve groundwater problems for a variety of reasons. Where local and regional agencies have been unable or unwilling to manage their groundwater sustainably, the state is authorized to step in to ensure that our precious groundwater resources are around for future generations. In all cases, the goal will be to develop long-term, sustainable groundwater management at the local or regional level – not management in Sacramento.

Q. What about surface water?

A. Surface and groundwater are interconnected and must be managed together. This groundwater legislation is one component of the California Water Action Plan, which is a comprehensive approach to both ground and surface water management. In places where local agencies manage groundwater sustainably, they generally have developed a broad range of strategies, including conservation, replenishment projects, stormwater capture and water recycling. Groundwater management plans and programs for specific areas will need to be integrated with surface water management within their regions, depending on the overall make-up of local water supplies.

Q. Why are you not talking about new reservoirs?

A. Expanding water storage capacity, both on the surface and underground, is one of the key elements identified in the California Water Plan. When it comes to groundwater, however, there are no easy fixes. In addition to more surface storage, we need to consider a broad range of management options, including recharging groundwater with surface water, conservation, increased use of recycled water, capturing and re-using stormwater, and better integration among regional projects. Local agencies that manage groundwater successfully typically use a variety of these tools. In areas where groundwater overdraft and water quality concerns have been mounting for decades, local agencies can probably only resolve them though a diverse set of solutions.

Q. How will the water bond benefit groundwater?

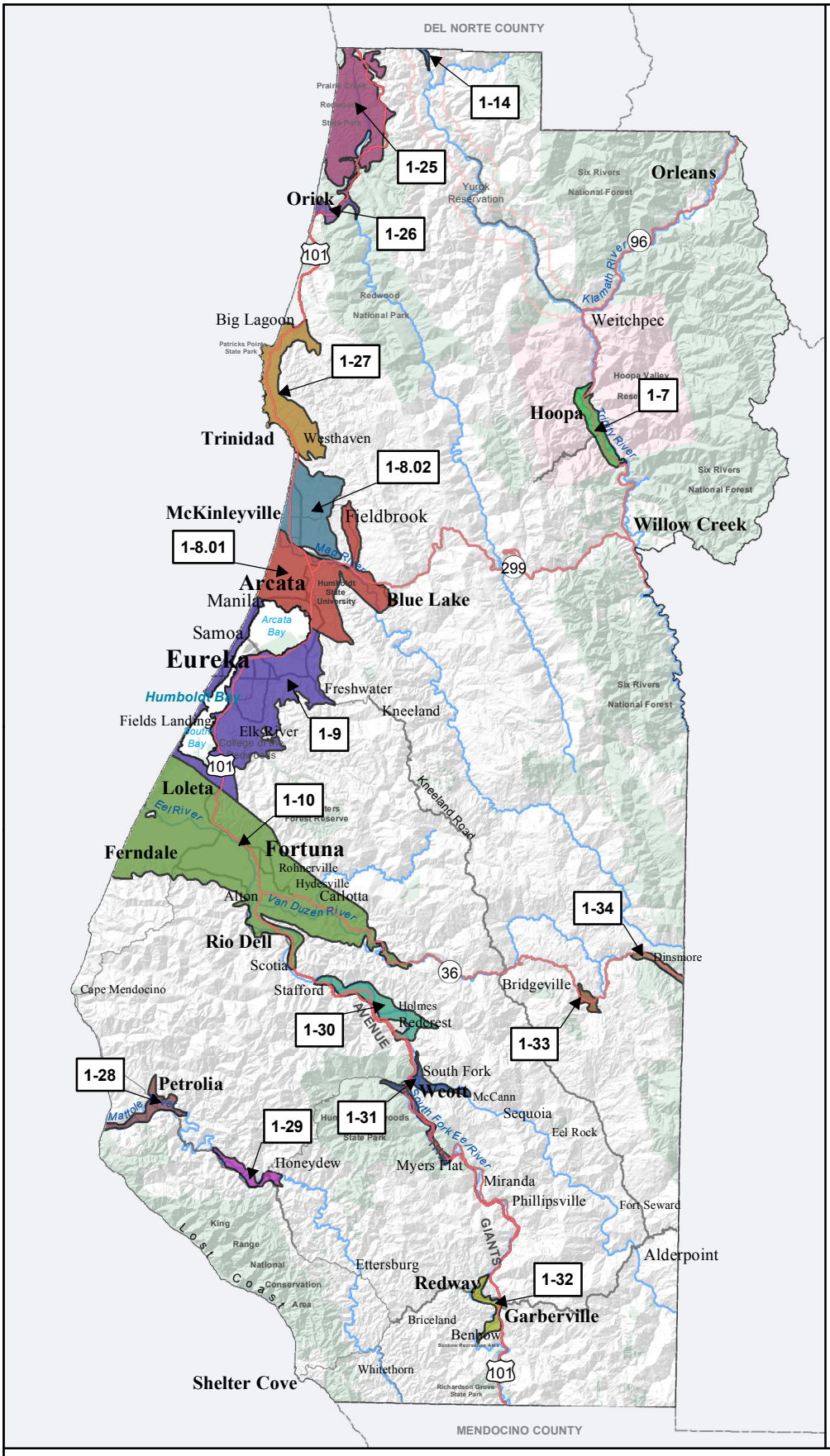
A. The water bond will provide $100 million for competitive grants for preparation of sustainable groundwater plans and implementation of groundwater management projects. The bond also provides billions more for groundwater cleanup, storage projects and other actions that will help local agencies manage groundwater sustainably.

Key Dates

- **January 31, 2015**: Department of Water Resources (DWR) establishes groundwater basin priorities. This will determine which basins require groundwater sustainability plans.
- **2015 to 2016**: DWR identifies basins subject to critical conditions of overdraft.
- **January 1, 2016**: DWR adopts regulations to revise basin boundaries.
- **June 1, 2016**: DWR adopts regulations for evaluating groundwater sustainability plans.
- **December 31, 2016**: DWR publishes report on water available for replenishment of groundwater in the state.
- **January 1, 2017**: DWR publishes best management practices for the sustainable management of groundwater.
- **June 30, 2017**: Local agencies must establish groundwater sustainability agencies.
- **July 1, 2017**: State may designate probationary basins where groundwater sustainability agencies are not established.
- **January 31, 2020**: Groundwater sustainability plans are adopted and implementation is under way for basins in critical overdraft. Plans are submitted to DWR for adequacy review upon adoption.
- **January 31, 2022**: Groundwater sustainability plans are adopted and implementation is under way for high and medium priority basins not in critical conditions of overdraft. Plans are submitted to DWR for adequacy review upon adoption.
- **January 31, 2040**: Groundwater sustainability agencies in critically over drafted basins achieve sustainability goal.
- **January 31, 2042**: Groundwater sustainability agencies in basins not in critical condition of overdraft achieve sustainability goal.

Attachment 2

Map of Designated Alluvial Groundwater Basins in Humboldt County



Legend

- Parks/Open Space
- Reservation/Tribal Land
- Highways
- Rivers

Basin/Subbasin

- 1-10 Eel River Valley
- 1-9 Eureka Plain
- 1-8.01 Mad River Lowland
- 1-8.02 Dows Prairie School Area
- 1-25 Prairie Creek Area
- 1-27 Big Lagoon Area
- 1-30 Pepperwood Town Area
- 1-7 Hoopa Valley
- 1-31 Weott Town Area
- 1-28 Mattole River Valley
- 1-29 Honeydew Town Area
- 1-26 Redwood Creek Area
- 1-32 Garberville Town Area
- 1-33 Larabee Valley
- 1-34 Dinsmores Town Area*
- 1-14 Lower Klamath River Valley*

* Basin only partially within Humboldt County

N
W E
S

0 5 10 20 Miles

Map created: February 13, 2014
County of Humboldt Department of Public Works

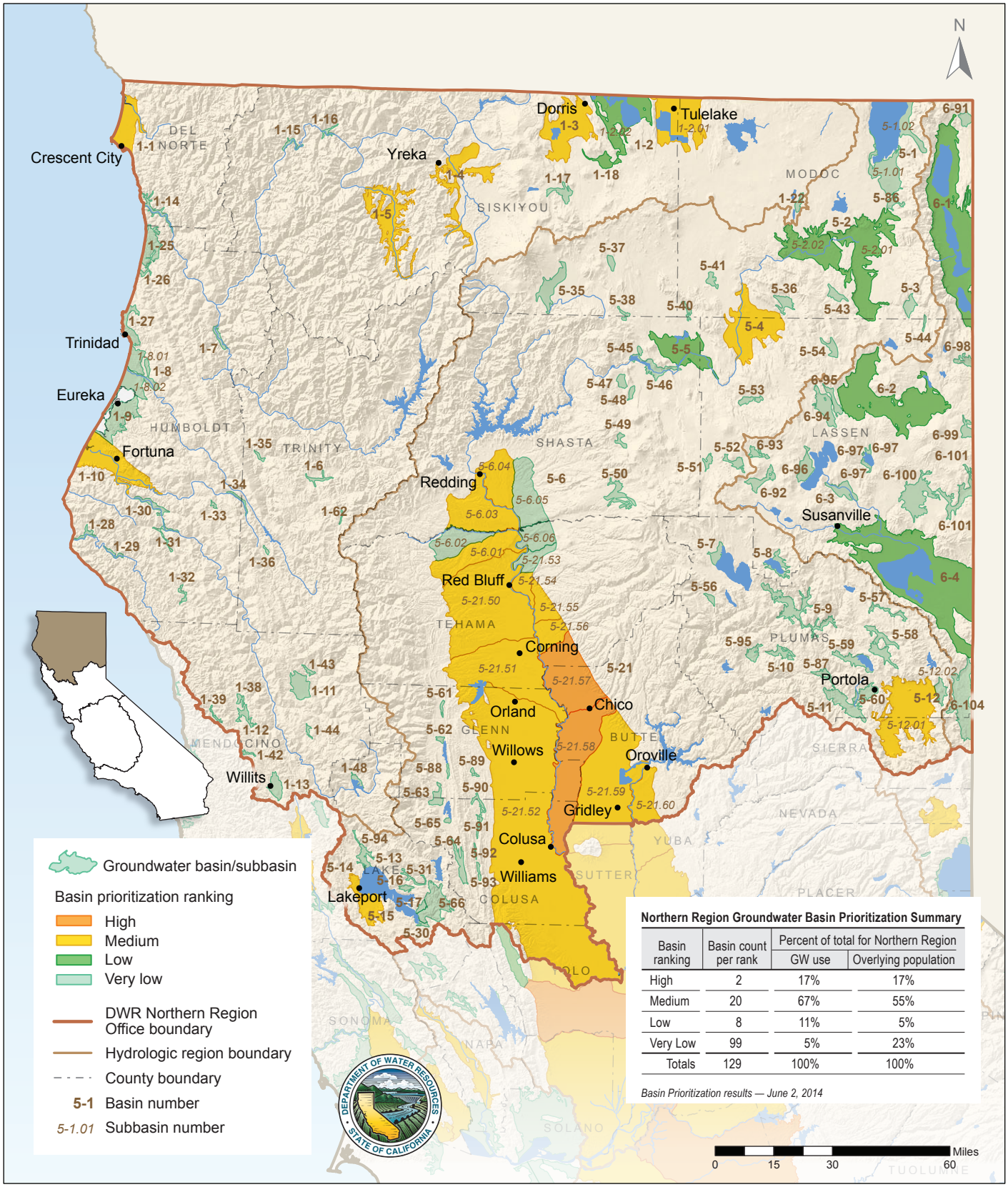
This map is intended for display purposes and should not be used for precise measurement or navigation.

Department of Water Resources Bulletin 118
Alluvial Groundwater Basins/Subbasins
Humboldt County, California

Attachment 3

CASGEM Groundwater Basin Prioritization (Northern Region)

CASGEM Groundwater Basin Prioritization — Northern Region



Northern Region Groundwater Basin Prioritization Summary

Basin ranking	Basin count per rank	Percent of total for Northern Region	
		GW use	Overlying population
High	2	17%	17%
Medium	20	67%	55%
Low	8	11%	5%
Very Low	99	5%	23%
Totals	129	100%	100%

Basin Prioritization results — June 2, 2014

Attachment 4

Summary of Initial Stakeholder Input

Attachment 4

Summary of Initial Stakeholder Input
Sustainable Groundwater Management Act

Interviews conducted by Robert Vogt, Senior Environmental Analyst, Humboldt County Public Works

Denver Nelson (concerned citizen) – August 5, 2014
Concerned about State involvement in the development of groundwater plans and long term management of the plans. Wants to develop a plan and ordinance quickly through Humboldt County, needs to include all basins not just the Eel River Basin.

John Vevoda (local dairyman) – August 12, 2014
Does not want the State to regulate our local groundwater resources. Concerned about recent ruling on the Scott River, that the public trust doctrine can be applied to groundwater extraction that affects navigable waters. Water use is a right and goes with the land; the Scott River ruling jeopardizes this understanding. Need to include all wells in this program not just agricultural wells. Suggests consideration of a "water master" that would monitor water use.

Dave Fisch (licensed driller) – August 13, 2014
The most significant issue that we must prepare for and determine if current issue or not is salt water intrusion. There is good process out there with the development of wells, all well drillers use DWR Form 188, this is filed with County and DWR, customer and driller keep copies as well. Could tweak this system to maintain confidentiality but get data from well. Should make a County law that only licensed well drillers for well permits, also that only certified pump service company can break well seals, or permits for pulling, maintaining, or breaking well seal. Mentioned that the public trust doctrine needs to be protected by the County. Management of the program needs to have someone with knowledge of issues (well construction, geology, soils, aquifer types, pumping, etc.) He estimates a couple thousand wells in Humboldt County currently.

Katherine Ziemer (Humboldt County Farm Bureau) – August 26, 2014
Her biggest issue is the associated fees that will inevitably come with another regulatory program. Her constituents are heavily regulated and just recently received notification from the SWRCB that there will be fees associated with their Waivers of WDR's associated with dairies. The RWQCB had initially indicated to local dairy owners that there would be no fees associated with these waivers as part of initial enrollment process. She relayed that the Farm Bureau believes this is the number one issue facing the industry in the last 20 years. She acknowledged the need to have regulation or policy that will maintain water rights and sustain groundwater levels. Whatever is developed needs to be simple to implement and manage for landowners with no additional fees.

Yana Valachovic and Jeff Stackhouse (UC Cooperative Extension) – September 5, 2014
Whatever program is developed will need to include all available resources not just agricultural,

and it can't be complaint driven. Very important issue is the ability to calculate sustainability accurately. Also, how do you calculate the recharge rate, what is it, how does it occur? Had suggestions for assisting with developing a program: contact a geologist to determine issues around measuring sustainability, have a retired locally knowledgeable geologist on a committee, and use a phased approach to implement ("period of study" of three years or so, no costs, no permitting) groundwater quantity measurement and the recharge. Important to recognize that these are new State regulations and the impending State involvement in the management of our water resources rather than local control if we don't complete the process according to the regulatory timeline.

Jeff Dolf (Agricultural Commissioner) – September 19, 2014

The most significant issue for agricultural constituents is the impacts to private property rights as they relate to groundwater. Will this new regulation take away the private property aspect of groundwater which is critically important to agricultural producers for crop and feed production and pasture irrigation? Questions that he had relating to management, are we going to set thresholds on extraction to limit what agriculture can use, will there be ultimate compliance limits, and how will those limits be enforced? He felt strongly that the County needs our own plan and does not want to see involvement from the State in the control of local groundwater. We discussed the applicability to all the basins or just the Eel River basin. We would need to look at the different aspects of each basin and not develop a one size fits all approach, each basin has its own conditions that impact not only the amount of groundwater available but how much can be withdrawn and what the recharge levels are per basin.

Norm Crawford (County Environmental Health Division) – September 17, 2014

Environmental Health processes well permit applications for land use and environmental contamination. Environmental contamination wells are used by both County Health and the Regional Water Quality Control Board to investigate contamination from underground storage tanks, pipes, spills, etc. These data are tracked on the State's Geo Tracker database which has a listing of all monitoring wells by location (town, business, street, etc.). These types of wells can also be obtained by individuals that are doing due diligence work in association with a property purchase. The Land Use wells are typically observation wells for septic system design, and proper percolation. They also cover the installation of drinking water wells, the two need to be coordinated so that a drinking water well is not located close to septic systems.

Roland Rueber, Erik Nielsen, Mike Foget (SHN Consulting Engineers and Geologists – September 16, 2014

Understanding the volume of groundwater (acre-feet) is a very important step for determining sustainability. Recharge is also a critical component to determine what is returned to the groundwater table year in and year out. In order to get these data points need good well monitoring, it may be necessary to place some wells in locations where there is not enough data. They suggested using the DWR wells in existence for determining baseline and using DWR current data for the groundwater table volumes. For Humboldt County, measuring the main parameters for recharge can be a challenge in our geologically diverse location. Recharge is dependent on rainfall, runoff, snowfall, infiltration, recharge locations, and river/stream recharge through percolation (gain and losing water body). Also, groundwater volume can be a challenge with differences in soil types which affects the soil porosity, one of the main determiners for

capacity of groundwater storage along with saturated depth, surface area, and specific yield. For measuring depths, they suggest voluntary measuring at first from metered devices, then mandatory at some time in the future once the program gets up and running. Meters would have to be certified and inspected by the County to assure compliance with sustainability monitoring. Suggest that when a well permit is requested that a licensed hydrogeologist could be required to file for and list the basin intended to drill, with well construction details and water levels.

Norm Crawford and Mark Verhey (County Environmental Health Division) – September 29, 2014

There was a Federal USGS study of the Eel River Basin some time ago that looked at nitrate levels, this study may have relevant data. There are some new homeland security-based regulations that limit what you can find out about water wells. Information submitted by drillers should be looked at closely by qualified personnel to ensure accurate information. Biggest challenge will be to determine what is being pumped out of basin in order to calculate the usage. Currently, landowners have not been asked to furnish this information, there are limited amount of meters on the wells in the County. This will be new for landowners/owners of wells. Placing wells on a map will be a large undertaking. Different groundwater conditions exist in different basins so cannot lump all together under one management scenario. Basins in Humboldt County recharge differently, the Eel River has a high recharge rate.

Jack Rice (rancher, legal counsel for California Farm Bureau Federation) – October 2, 2014

Local management of the groundwater process is the preferred alternative. Concerned about government efficiency and the impact that will have on local agricultural industry. There are many programs/regulations that local agricultural industry (farmers, ranchers, timber) are managing day to day, any additional regulatory burden will be costly. Recommended looking at Section 10733.6(b)(3) with description of the "sustainable yield" over 10 years for acceptance as an alternative plan and management. For groundwater monitoring data, could look at abandoned wells, some active wells that we can access (DWR), and could also look at electric bills to get an idea of how much pumping occurred for a given well. There is a standard conversion you can use for kW and pumping rates. Very important to coordinate the Dairy Waiver program (SWRCB/RWQCB) to this groundwater management process, specifically with "degraded water quality" included as an "undesirable result." Management agency has to be identified for the county by June 30, 2017.

Edited February 2, 2015

Attachment 5

Summary of Eel River Valley Groundwater Basin

Eel River Valley Groundwater Basin

- Groundwater Basin Number: 1-10
- County: Humboldt
- Surface Area: 73,700 acres (115 square miles)

Basin Boundaries and Hydrology

The Eel River Valley Groundwater Basin is one of the principal groundwater basins in the Eureka area of Humboldt County. The area includes the lower 8 miles of the Van Duzen River Valley and the Eel River Valley. The basin is bordered on the north by the Little Salmon Fault, on the south by the Plio-Pleistocene Carlotta Formation, and to the east by the Wildcat series; however, the actual extents of the eastern boundary is uncertain (Strand 1963, Clark 1990). The Wildcat series is a group of five formations ranging in age from Miocene to Pleistocene consisting of sandstone, marine siltstone, and claystone (Evenson 1959). The Carlotta Formation forms the uppermost formation of the Wildcat series. Surficial deposits of the Carlotta Formation are observed north and south of the Van Duzen River valley, located in the southeastern portion of the basin, and is an important water-bearing formation.

The basin includes the Eel River delta and channel gravels, floodplain clays and silts, and older terrace gravels of the Eel River and Van Duzen River. The basin also includes outcrops of the Hookton and Carlotta Formations in the northern and southern portions of the valley.

Annual precipitation in the basin ranges from 41 to 55 inches, increasing the southeast.

Hydrogeologic Information

The aquifer system of the Eel River Valley Basin is primarily composed of alluvium underlain by the Hookton and Carlotta Formations. Upland areas to the northeast are comprised of the Hookton Formation underlain by the Carlotta Formation. The Carlotta Formation is underlain by the remainder of the Pliocene Wildcat series. The Little Salmon Fault forms a hydrologic barrier to the north.

Water-Bearing Formations

Water-bearing formations include Quaternary river channel and floodplain deposits, the Carlotta Formation and, to a lesser extent, the Hookton Formation. The major aquifer in the basin is the alluvium that underlies the floodplain of the Eel River Valley (Evenson 1959).

Holocene Alluvium. The alluvial deposits underlying the Eel River delta consist of blue clay or sandy clay ranging in thickness from 1- to 75-feet. Between the Eel and Salt rivers, the alluvium consists of coarse sand and gravel from the surface to depths of 60 feet or more. Coarse gravel and sand containing minor amounts of silt and clay extend upstream along the Eel River to its confluence with the Van Duzen River.

The Eel River valley is underlain by poorly sorted sand and gravel, as much as 200 feet in thickness. Most of the groundwater used in this area is

obtained from wells tapping these beds. (Evenson 1959). Specific capacities range up to 600 gpm per foot of drawdown (DWR 1965).

Pleistocene Hookton Formation. The Hookton Formation underlies the alluvium in the river floodplain and is exposed in the northern 20 percent of the basin and also outcrops along the southern boundary. The formation consists of yellow to yellow-brown loosely consolidated clay, silt, sand, and gravel, interfingered with blue-gray marine clay and silt. Thickness of the formation ranges up to 100 feet (USBR 1960).

Plio-Pleistocene Carlotta Formation. The Carlotta Formation, a portion of the upper Wildcat group, is a poorly consolidated brown conglomerate and sandstone of continental origin with some marine blue-gray claystone and siltstone. Along the southern part of the Eel and Van Duzen River valleys, these sediments consist primarily of poorly sorted cobble conglomerate of nonmarine origin and fairly well sorted sandstone containing minor interfingering clay beds of marine origin. The formation may extend as far north as the Mad River. Well yields vary in the formation and are generally less that yields from alluvial deposits. West of Ferndale, wells drilled into the Carlotta Formation yield 1,200 gpm (DWR 1965). East of Ferndale, wells can yield 500 gpm (DWR 1965). Generally, specific capacities range from 15- to 20-gpm per foot of drawdown (Evenson 1959).

Restrictive Structures

The Little Salmon Fault is likely a hydrologic barrier to the north.

Recharge Areas

Recharge to the alluvium is from direct precipitation and seepage from the Eel and Van Duzen Rivers. Some groundwater also moves laterally from adjacent formations and also moves upward due to differences in hydraulic head between the alluvium and underlying formations. Direct recharge to the Carlotta Formation from streamflow likely occurs as the Van Duzen River transverses exposures of the formation in the eastern third of the basin.

Groundwater Level Trends

The depth to groundwater in the alluvium ranges from about 3 feet to 20 feet. Depth to groundwater for wells constructed in the Carlotta Formation is to within 35 feet of ground surface. North of Loleta, near Table Bluff, depth to which water is encountered is reported to be 300 feet. (DWR 1965)

Groundwater Storage

Groundwater Storage Capacity. Evenson (1959) estimates storage capacity for the basin to be 125,000 acre-feet based on a surface are of 19,400 acres and an average specific yield of 22 percent. The saturated thickness varied from 10- to 40-feet.

DWR (1975) estimates the storage capacity for the basin to be 136,000 acre-feet. Useable storage capacity is estimated to be 100,000 acre-feet.

Groundwater Budget (Type B)

Estimates of groundwater extraction are based on a survey conducted by the California Department of Water Resources in 1996. The survey included landuse and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 49,000 and 1,400 acre-feet respectively. Deep percolation from applied water is estimated to be 9,500 acre-feet.

Groundwater Quality

Characterization. Groundwater in the basin is characterized as magnesium-calcium bicarbonate and magnesium-sodium bicarbonate type waters. Total dissolved solids (TDS) range from 110- to 340-mg/L, averaging 237 mg/L (DWR unpublished data).

Impairments. Impairments to groundwater include high iron concentrations and locally high TDS, manganese, magnesium, calcium, boron, nitrite, and phosphorus.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	24	0
Radiological	14	0
Nitrates	27	0
Pesticides	8	0
VOCs and SVOCs	12	0
Inorganics – Secondary	24	8

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Production characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: up to 1,200	Average: 400 (DWR 1975)
	Total depths (ft)	
Domestic	Range: 13 - 415	Average: 108 (219 Well Completion Reports)
Municipal/Irrigation	Range: 20 - 572	Average: 133 (12 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	8 wells semi-annually
DWR	Miscellaneous water quality	11 wells biennial
Department of Health Services and cooperators	Miscellaneous water quality	29

Basin Management

Groundwater management:	No known groundwater management plans, groundwater ordinances, or basin adjudications.
Water agencies	
Public	Hydesville County WD
Private	

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Errata

Changes made to the basin description will be noted here.