

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

SUPPLEMENTAL SHEET FOR REGULAR MEETING OF MAR 17-18, 2018
Prepared March 8, 2016

ITEM NUMBER: 18
SUBJECT: Environmental Justice Update for the Central Coast Region
STAFF CONTACT: Angela Schroeter 805/542-4644
Angela.Schroeter@waterboards.ca.gov

KEY INFORMATION

LOCATION: Region-Wide
THIS ACTION: Informational

SUMMARY

This is a Supplemental Sheet for Item 18 which is an informational item to update the Central Coast Water Board on environmental justice (EJ) activities in the Central Coast Region.

Environmental Justice Resolutions

On February 16, 2016, the State Water Board adopted a resolution which establishes the human right to water as a core value and provides direction and guidance to the Water Boards to ensure consistency in the manner in which the human right to water is considered in certain actions (Resolution No. 2016-0010). In addition, the State Water Board also adopted a resolution which directs staff to develop proposed beneficial uses pertaining to tribal traditional and cultural, tribal subsistence fishing, and subsistence fishing (Resolution No. 2016-0011). State Board Resolutions No. 2016-0010 and No. 2016-0010 are included as Attachment 1 to this Supplemental Sheet.

Environmental Justice Tour – March 7, 2016

On Monday, March 7, 2016, the Environmental Justice Coalition for Water (EJCW) conducted a second EJ/Safe Drinking Water Tour for the Central Coast Region. Recognizing that residents of disadvantaged communities often have great difficulty in attending Water Board hearings, workshops, and otherwise engaging in Water Board activities, one of the continuing objectives of the EJ tour was to provide Board Members and staff with an opportunity to meet directly with the communities in a local and informal forum to hear the community member perspective on drinking water contamination and EJ issues. The tour started in Salinas and included four main stops representing both southern and northern Monterey County communities: 1) the San Jerardo Farmworker Cooperative, 2) the Santa Teresa Village community, 3) the Castroville Community Services District, and 4) the Harden Foundation for an informal lunchtime forum. The detailed agenda for the March 7 EJ Tour is included in Attachment 2.

Tour attendees included Central Coast Water Board Members Jean-Pierre Wolff, Monica Hunter, and Michael Johnston, State Water Board Members Tam Doduc and Frances Spivy-Weber, Central Coast Water Board staff, State Water Board staff, representatives from EJCW, Castroville Community Services District (Castroville CSD), Community Housing Improvement Systems and Planning Association, Inc. (CHISPA), Californians for Pesticide Reform, as well as community residents from Santa Teresa Village, San Jerardo Farmworker Cooperative, Royal Oaks and Castroville areas. As many of the community members are Spanish-speaking, Central Coast Water Board staff assisted EJCW in providing real-time translation to ensure community members could actively participate in the discussion.

The EJ Tour included robust dialogue among all participants about the challenges individuals and communities face when dealing with the different facets of drinking water contamination and EJ issues in the Salinas Valley and region-wide. Among many issues, the group discussed the scale of groundwater nitrate contamination of drinking water sources, impacts to private and public drinking water wells, difficulty in obtaining short and long term assistance to obtain safe drinking water (e.g. bottled water, treatment, new wells, consolidation, etc.), who should be responsible for funding replacement water (the affected community, public, or industries or parties responsible for discharging nitrate to groundwater), challenges in receiving grant funds due to eligibility criteria and definitions of disadvantaged community, and challenges related to water system governance. In particular, the San Jerardo representatives expressed urgent concern related to the imminent possibility of losing control of their water system due to pending sale from Monterey County to a private water purveyor, and requested assistance from the Water Board to ensure that the community is afforded the opportunity to provide input and to assess whether such sale is appropriate given that the water system was funded by Water Board grant funds.

The group also discussed the importance of the Human Right to Water Law (HRTW) and the recent State Water Board Resolution to support implementation of the HRTW at the Water Boards. Finally, the group affirmed the importance of continuing to engage the local community members and EJ representatives so that they are able to actively participate in discussions and provide substantive, meaningful input to identifying and implementing short and long term solutions that directly affect their communities and their drinking water .

Staff received positive feedback from the EJ representatives and tour participants. Community members sincerely appreciated Board Members providing the time and opportunity to engage with Board Members in an informal, local setting to discuss water quality issues. Board Members expressed that the tour was a positive experience to learn first-hand about the EJ communities that are affected by issues facing the Water Board.

Comments

The following individuals submitted comments regarding Item 18 (included in Attachment 3).

- Dr. Edo McGowan; Public comments regarding the use of recycled water and potential contaminants received via email on February 29, 2016 and March 3, 2016.

ATTACHMENTS

1. Press Release and State Board Resolutions No. 2016-0010 and No. 2016-0010
2. March 7, 2016 Environmental Justice Tour Agenda
3. Public comments on Item 18 from Dr. Edo McGowan



Media Release

State Water Board Adopts Pair of Resolutions on the Human Right to Water, Beneficial Use

FOR IMMEDIATE RELEASE
Feb. 16, 2016

Contact: Andrew DiLuccia
andrew.diluccia@waterboards.ca.gov

SACRAMENTO – Today the State Water Resources Control Board (State Water Board) highlighted the important uses of water, both for drinking and cultural use, by adopting a pair of resolutions related to the human right to water, Native American tribal cultural uses of water and subsistence fishing.

Assembly Bill (AB) 685, signed by Governor Edmund G. Brown Jr. in 2012, added section [106.3 to the Water Code](#) on Jan. 1, 2013 declaring every human has a right to clean, affordable and accessible water for consumption, cooking, and sanitary purposes.

The adopted resolution identifies the human right to water as a top priority and core value of the state and regional Water Boards “to preserve, enhance, and restore the quality of California’s water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations.”

The resolution affirms the State Water Board’s commitment to consider how its activities impact and advance the human right to safe, affordable and clean water to support basic human needs. Actions taken by the Water Boards in which the human right to water would be considered are those that implicate sources of drinking water. They include revising or establishing water quality control plans, policies and grant criteria; permitting; site remediation and monitoring; and water right administration.

Under the resolution, State Water Board staff will work with relevant stakeholders to -- as resources allow -- develop new or enhanced systems to collect data needed to identify and track communities that do not have, or are at risk of not having, safe, clean, affordable and accessible water for drinking, cooking and cleaning.

Another point highlighted in the resolution is that State Water Board staff will prepare annual progress reports to the board regarding implementation of the human right to water, and those benchmarks will be incorporated into the State Water Board’s annual [performance report](#).

Understanding and recognizing California Native American tribes’ cultural connection to the waters of the state, and subsistence fishing by tribes and other cultures, the State Water Board

C A L I F O R N I A E N V I R O N M E N T A L P R O T E C T I O N A G E N C Y



STATE WATER RESOURCES CONTROL BOARD
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adopted a resolution to direct staff to develop proposed [beneficial use categories](#) pertaining to those uses. The resolution also directs the Board to consider the proposed beneficial use categories no later than April 2017.

The resolution also directed staff to engage Native American tribes in the public participation process when developing these beneficial use categories, as well as seek input from environmental justice groups, the regulated community and other interested stakeholders.

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**STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2016-0010**

**ADOPTING THE HUMAN RIGHT TO WATER AS A CORE VALUE AND DIRECTING ITS
IMPLEMENTATION IN WATER BOARD PROGRAMS AND ACTIVITIES**

WHEREAS:

1. With the enactment of Water Code section 106.3, on September 25, 2012, California became the first state in the nation to recognize legislatively the human right to water, following two other state's recognition of the right in their respective constitutions.
2. Water Code section 106.3 provides, in full:
 - (a) It is hereby declared to be the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.
 - (b) All relevant state agencies, including the department, the state board, and the State Department of Public Health, shall consider this state policy when revising, adopting, or establishing policies, regulations, and grant criteria when those policies, regulations, and criteria are pertinent to the uses of water described in this section.
 - (c) This section does not expand any obligation of the state to provide water or to require the expenditure of additional resources to develop water infrastructure beyond the obligations that may exist pursuant to subdivision (b).
 - (d) This section shall not apply to water supplies for new development.
 - (e) The implementation of this section shall not infringe on the rights or responsibilities of any public water system.
3. Effective July 1, 2014, the State's Drinking Water Program was transferred from the California Department of Public Health to the State Water Resources Control Board (State Water Board).
4. To reflect the expanded scope of the State Water Board's public health responsibility, on February 3, 2015, the board clarified and revised its mission statement as follows: "To preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations."
5. The State Water Board recognizes that a wide range of activities and projects undertaken by the State Water Board and the Regional Water Quality Control Boards (Regional Water Boards) (collectively, Water Boards) may involve the human right to water, as established by Water Code section 106.3, subdivision (a).

6. Preventing and/or addressing discharges that could threaten human health by causing or contributing to pollution or contamination of drinking water sources of waters of the state, are among the Water Boards' highest priorities, and such discharges should be regulated to attain the highest water quality which is reasonable, considering all demands being made on those waters and the total values involved. (Wat. Code, §§ 13000, 13050, subds. (i)-(m), 13240, 13241, 13263.) When regulating discharges that could threaten human health by causing or contributing to pollution or contamination of drinking water sources, the Water Boards may consider all solutions for ensuring safe drinking water, including providing replacement water as an interim solution while long-term water quality solutions are developed.
7. The Federal Water Pollution Control Act Amendments of 1972, as amended (33 U.S.C. § 1251 et seq. (Clean Water Act)), and the Porter-Cologne Water Quality Control Act (Wat. Code, Div. 7, § 13000 et seq.) require the Water Boards to protect all beneficial uses of water, including municipal or domestic water sources (MUN) to ensure their suitability for those uses in water quality control planning and permitting actions. (Wat. Code, §§ 13241, 13263, subd. (a), 13050, subds. (f) and (h).)
8. The State Water Board's Sources of Drinking Water Policy (State Water Board [Resolution No. 88-63](#)) presumes that most surface and ground waters of the state are "suitable, or potentially suitable, for municipal or domestic water supply" (MUN).
9. The Regional Water Boards administer the Sources of Drinking Water Policy through their respective water quality control plans by designating water bodies as suitable, or potentially suitable, for municipal or domestic water supply (MUN).
10. In acting on applications to appropriate water, the State Water Board must consider "the relative benefit to be derived from [...] all beneficial uses of the water concerned," including domestic uses, "and any uses specified in any relevant water quality control plan[.]" "The board may subject such proposed appropriations to such terms and conditions as in its judgment will best develop, conserve, and utilize in the public interest, the water sought to be appropriated." (Wat. Code, § 1257.) The State Water Board has continuing authority over permitted and licensed appropriations, and authority to ensure the water resources of the state are put to beneficial use to the fullest extent and that water not be wasted or unreasonably used. (*Id.*, §§ 100, 275.)
11. Water Code section 189 established the Office of Sustainable Water Solutions within the State Water Board "to promote permanent and sustainable drinking water and wastewater treatment solutions to ensure effective and efficient provision of safe, clean, affordable, and reliable drinking water and wastewater treatment services," focusing on, among other actions, addressing financial and technical assistance needs for disadvantaged communities, and promoting regional solutions to communities unserved or underserved by public water systems and wastewater treatment systems. "Disadvantaged community" is defined as "a community with an annual median household income that is less than 80 percent of the statewide annual median household income." (Wat. Code, § 79702, subd. (j) (incorporating Water Code section 79505.5).)

12. Water Code section 189.5, referred to as the Low-Income Water Rate Assistance Act, requires the State Water Board, in collaboration with relevant stakeholders and the State Board of Equalization, to develop a plan, no later than January 1, 2018, to fund and implement the Low-Income Water Rate Assistance Program. The Act requires the State Water Board to report to the Legislature no later than February 1, 2018, on its findings regarding the program's feasibility, financial stability, and desired structure, and include any recommendations for legislative action. (Wat. Code, § 189.5, subds. (a)-(b), (e)(1).)
13. Considerations relevant to the affordability of water for human consumption, cooking, and sanitary purposes include economic and cost factors, water supply operation and maintenance expenses, and household incomes.
14. The amount of water necessary for human consumption, cooking, and sanitary purposes varies by individual circumstance but assumptions in current law provide information regarding a reasonable maximum daily per capita human use. The Water Efficiency Act of 2009 identifies 55 gallons per capita per day as a provisional conservation standard for "indoor residential water use" by 2020. (Wat. Code, § 10608.20, subd. (b)(2)(A).) Similarly, a prior State Water Board emergency regulation established an exemption from a prohibition on diverting water, under specified circumstances, up to a maximum of 50 gallons per capita daily in order to meet "minimum health and safety needs." (Cal. Code Regs., tit. 23, § 878.1, subds. (a)-(b) [operative March 30, 2015 and repealed Dec. 29, 2015].)
15. At the March 3, 2015 State Water Board meeting, staff reported on the status of the implementation of the human right to water. Staff presented results of a survey concerning the wide range of activities and projects undertaken by the Water Boards that address the human right to water through actions to protect any existing or potential MUN beneficial use, including but not limited to, basin planning, permitting actions, site remediation, monitoring, and water right administration.
16. In consideration of the legislative enactment of the human right to water and the Water Boards' ongoing efforts to consider or promote attainment of that right, it is appropriate for the State Water Board to provide clear and transparent guidance to State Water Board staff and the Regional Water Boards concerning the manner in which the human right to water continue to be administered.

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Adopts the human right to water as a core value and adopts the realization of the human right to water as a top priority for the Water Boards.
2. Will continue to consider, and encourages the Regional Water Boards to continue considering, the human right to water in all activities that could affect existing or potential sources of drinking water (MUN), including, but not limited to, revising or establishing water quality control plans, policies, and grant criteria, permitting, site remediation, monitoring, and water right administration. However, this resolution does not expand the legal scope of the human right to water as described in Water Code section 106.3, alter the Water Boards' authority and obligations under applicable law, or impose new requirements on the regulated community.

3. Directs State Water Board staff to work with relevant stakeholders to, as resources allow, develop new or enhance existing systems to collect the data needed to identify and track communities that do not have, or are at risk of not having, safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.
4. Directs State Water Board staff to work with relevant stakeholders and develop performance measures for the evaluation of the board's progress towards the realization of the human right to water, evaluate that progress, and explore ways to make that information more readily available to the public.
5. Directs State Water Board staff to explore opportunities for the State Water Board, and when practical, in partnership with other governmental agencies or organizations, non-profit organizations, impacted communities, and private businesses, to work toward realizing the human right to water within the State Water Board's administration of its programs and projects.
6. Directs the State Water Board's Office of Sustainable Water Solutions to provide, when feasible and as resources allow, technical and compliance assistance to disadvantaged communities to develop the capacity of the recipient community to evaluate solution(s) and select a sustainable approach that supports the human right to water.
7. Directs State Water Board staff, when submitting a recommendation to the board pertinent to the human right to water, to describe how the right was considered, and encourages Regional Water Board staff to do the same when making pertinent recommendations to their boards.
8. Directs State Water Board staff and encourages Regional Water Boards, as resources allow, to meaningfully engage with communities that lack adequate, affordable, or safe drinking water, including providing community outreach, technical assistance and financial resources, as part of the Water Boards' administration of programs or project funding pertinent to human right to water, including those described in recitals 11 and 12.
9. Directs State Water Board staff and encourages Regional Water Boards to evaluate the extent to which a proposed project, plan, decision, or action, pertinent to the human right to water, has been developed with meaningful engagement of impacted communities.
10. Encourages Water Board staff to consider existing law and policies that may be relevant to assessing water safety, cleanliness, affordability, accessibility, adequacy, and sustainability, such as those referred to in recitals 7-14, when considering the human right to water.
11. Directs State Water Board staff to incentivize regional approaches, where appropriate, by implementing financial assistance programs to address communities unserved or underserved by public water systems and wastewater treatment systems.

12. Encourages Regional Boards to consider developing policies that allow for and incentivize local and regional efforts for providing replacement water where appropriate while long-term water quality solutions are developed and implemented.
13. Directs State Water Board staff to provide annual progress reports to the board regarding implementation of the human right to water, and incorporate that information into the board's annual performance report. The report shall identify successful strategies that have furthered the realization of the human right to water.

CERTIFICATION


The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Board held on February 16, 2016.

AYE: Chair Felicia Marcus
 Vice Chair Frances Spivy-Weber
 Board Member Tam M. Doduc
 Board Member Dorene D'Adamo

NAY: None

ABSENT: Board Member Steven Moore

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

**STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2016-0011**

**DIRECTING STAFF TO DEVELOP PROPOSED BENEFICIAL USES PERTAINING
TO TRIBAL TRADITIONAL AND CULTURAL, TRIBAL SUBSISTENCE FISHING, AND
SUBSISTENCE FISHING**

WHEREAS:

1. The State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards) administer the Porter-Cologne Water Quality Control Act (Wat. Code, Div. 7, § 13000 et seq.) (Porter-Cologne Act) to achieve an effective water quality control program for the state.
2. The Porter-Cologne Act declares that “the people of the state have a primary interest in the conservation, control, and utilization of the water resources of the state, and that the quality of all the waters of the state shall be protected for the use and enjoyment by the people of the state.” (Wat. Code, § 13000.)
3. The State Water Board and Regional Water Boards (collectively, Water Boards) carry out their water quality protection authority through, among other actions, the adoption of water quality control plans. Through these plans, the Water Boards establish water quality standards, which are comprised of beneficial uses, the designation of specific waters with beneficial uses, water quality objectives to protect those uses, and an antidegradation policy.
4. Beneficial uses are the cornerstone of water quality protection. The Porter-Cologne Act provides that the beneficial uses of the state’s waters to be protected against degradation include, but are not limited to, “domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.” (Wat. Code, § 13050, subd. (f).)
5. The Water Boards may not establish a beneficial use category or definition until after a hearing is provided subsequent to providing adequate notice. (See Wat. Code, §§ 13244 (hearing and notice requirements), 13050, subd. (j) (defining “water quality control plan” as consisting of the establishment of beneficial uses).)
6. Even when a beneficial use category or definition is established, specific waters are not designated with that beneficial use unless a water quality standards action occurs to make the designation, which is typically done through the adoption of a water quality control plan (basin plan) amendment. Generally, the Regional Water Boards designate specific waterbodies within their respective region where the use applies. A Regional Water Board’s waterbody-designation would occur through its basin planning process in accordance with Water Code sections 13244 (hearing and notice requirements) and 13245 (approval by the State Water Board).

7. In 1973, the State Water Board provided a uniform list of beneficial uses, including descriptions, to the Regional Water Boards to use to subsequently designate waters within their respective regions where the use is occurring. The State Water Board updated that list in 1996. The State Water Board's updated list of beneficial uses does not contain an explicit beneficial use for tribal traditional, cultural, or subsistence fishing. In addition to the beneficial uses identified on the statewide list, the Regional Water Boards develop additional beneficial uses to be applied to waters within their respective region.
8. A water quality objective specifies the level of protection reasonably necessary to protect a beneficial use. A water quality objective for one beneficial use may be sufficiently protective of other beneficial uses. As a result, even when new beneficial uses are designated for a water body, that does not necessarily mean that additional water quality objectives, restrictions on waste discharges, or other new or different actions will be necessary. Existing water quality objectives for an existing beneficial use may be sufficient to protect the newly added beneficial uses. In instances where water quality objectives for existing beneficial uses are not protective of newly added beneficial uses, new water quality objectives may need to be developed.
9. Of the nine Regional Water Boards, only the North Coast Regional Water Board's basin plan explicitly lists (at p. 2-3.00) a beneficial use that pertains to the cultural and traditional rights of indigenous people.
10. The State Water Board recognizes the importance of identifying and describing beneficial uses unique to California Native American tribes, in addition to subsistence fishing by other cultures or individuals.
11. By letter dated October 1, 2013, Felicia Marcus, Chair of the State Water Board, wrote to a Tribal Ad Hoc Beneficial Use Group, which was comprised of twelve tribes or organizations, to acknowledge the importance of identifying tribal and cultural uses of water and request input regarding appropriate language for creating tribal and cultural beneficial uses. Chair Marcus also indicated that the first step toward the development of a beneficial use could be a proposed resolution by the State Water Board to direct staff to formally initiate the development of a beneficial use or uses. Felicia Marcus' letter and other documents related to tribal interests can be found [here](#).
12. In 2014 and 2015, State Water Board staff engaged with members of the Tribal Ad Hoc Beneficial Use Group and additional representatives of tribal interests, to receive their input concerning matters uniquely within their knowledge, tradition, and practices. During Spring 2015, eight tribes submitted resolutions to the State Water Board which propose specific language for two beneficial uses pertaining to tribal traditional and cultural use and tribal subsistence fishing. Their recommendation is set forth in Attachment A, item 1.
13. In 2014 and 2015, State Water Board Staff also received input from environmental justice representatives concerning the need for a beneficial use category for subsistence fishing by other cultures or individuals associated with their respective cultural customs, economic circumstances, or both. Their recommendation is set forth in Attachment A, item 2.

14. State Water Board staff is currently developing an amendment to the statewide Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries which includes numerous mercury water quality objectives pertaining to the consumption of fish, including tribal subsistence (Mercury Amendment). Staff's goal is to bring the Mercury Amendment to the State Water Board for consideration no later than April 2017.
15. On January 15, 2016, the State Water Board provided 30 days notice of this draft resolution by email notification to subscribers of the board's listserv for the following categories: board meetings, board workshops, tribal matters, regulations-general, fresh water plans and policies, and the California Ocean Plan.
16. The beneficial uses that the State Water Board would consider at the end of the public process contemplated by this resolution are for purposes of the Porter-Cologne Act, and may also serve as designated uses under the Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) (Clean Water Act). Beneficial uses under the Porter-Cologne Act are distinct from the statutory and common law beneficial uses applicable to appropriative water rights.

THEREFORE BE IT RESOLVED THAT:

The State Water Board

1. Directs State Water Board staff to develop proposed beneficial use categories, including definitions, pertaining to tribal traditional and cultural use, tribal subsistence fishing use, and subsistence fishing use by other cultures or individuals.
2. Directs State Water Board staff to consider the beneficial uses presented in Attachment A when developing the aforementioned proposed beneficial use categories.
3. Directs State Water Board staff to utilize the applicable public participation process when developing the proposed beneficial use categories and to seek input from representatives of tribes, environmental justice organizations, the regulated community, and all other interested entities and individuals. The board further directs staff, after substantially completing this public participation process, to bring an item to the board (no later than the end of Summer 2016) to provide an update on the input received for the board to consider and to provide further direction, if appropriate.
4. Unless direction is otherwise provided, will consider adopting the beneficial use categories and definitions proposed by staff as part of the Mercury Amendment to the statewide Water Quality Control Plan for Inland Surface Waters, Enclosed Bays and Estuaries, no later than April 2017, to create a consistent set of beneficial uses to be used by the Water Boards.

5. Affirms that specific waters are not designated with beneficial uses unless the State Water Board or a Regional Water Board does so through the process applicable to amending a statewide plan or basin plan, respectively.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 16, 2016.

AYE: Chair Felicia Marcus
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Dorene D'Adamo

NAY: None

ABSENT: Board Member Steven Moore

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

**ATTACHMENT A TO
STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2016-0011**

1. As referenced in recital 11 in the accompanying resolution, tribes and tribal representatives propose the following beneficial uses:

California Indian Tribal Traditional and Cultural Use: Uses of water that supports the cultural, spiritual and traditional rights and lifeways of California Indian Tribes. This includes but is not limited to: fishing, gathering, and safe consumption of traditional foods and materials, as defined by California Indian Tribes, for subsistence, cultural, spiritual, ceremonial and navigational activities associated with such uses.

California Indian Tribal Subsistence Fishing Use: Uses of water that supports the gathering and distribution of natural aquatic resources, including fish and shellfish, to meet traditional food needs of California Tribal individuals, households and communities for personal, family and community consumption, and for traditional and/or ceremonial purposes.

2. As referenced in recital 12 in the accompanying resolution, environmental justice representatives propose the following beneficial use:

Subsistence Fishing: Uses of water that support the non-commercial catching or gathering of natural aquatic resources, including fish and shellfish, by individuals for the personal consumption by individuals and their households or communities, to meet fundamental needs for sustenance due to cultural tradition, lack of personal economic resources, or both.

Tour Objective: Meet with community members facing environmental justice issues related to water quality and safe drinking water in the Salinas Valley.

TIME	LOCATION
8:45 AM	Introductions Meet at the Salinas Holiday Inn Express parking lot Address: 195 Kern St., Salinas, CA Leave personal vehicles at the hotel; mini-vans provided for tour. Contact(s): Vicente Lara, EJCW, 831/296-0375 Angela Schroeter, Regional Water Board, 805/542-4644
9:00 AM	Depart Holiday Inn Express parking lot for Santa Teresa Village Driving time to Santa Teresa - approximately 30 min. to south.
9:30 AM	Meet with community members from Santa Teresa and San Jerardo Farmworker Cooperative – Light snack provided Address: Santa Teresa Village - 2825 San Vicente Rd, Soledad, CA 93960 Contact: Vicente Lara, EJCW, 831/296-0375
11:00 AM	Depart Santa Teresa Village for Castroville Community Services District office Driving time approximately 45 min. to north.
11:45 AM	Meet with community members from Royal Oaks and Castroville Addresses: 11499 Geil St, Castroville, CA 95012 Contact: Vicente Lara, EJCW, 831/296-0375
1:15 PM	Depart Castroville Community Services District office for the Harden Foundation - Driving time approximately 30 min. to south.
1:45 PM	Arrive at the Harden Foundation Bunkhouse for lunch and group discussion. Bring \$15 for lunch. Address: 1636 Ercia St, Salinas, CA 93906 Contact(s): Vicente Lara, EJCW, 831/296-0375 Angela Schroeter, Regional Water Board, 805/542-4644
4:45 PM	Return to Salinas Holiday Inn Express parking lot. - Driving time approximately 15 min.

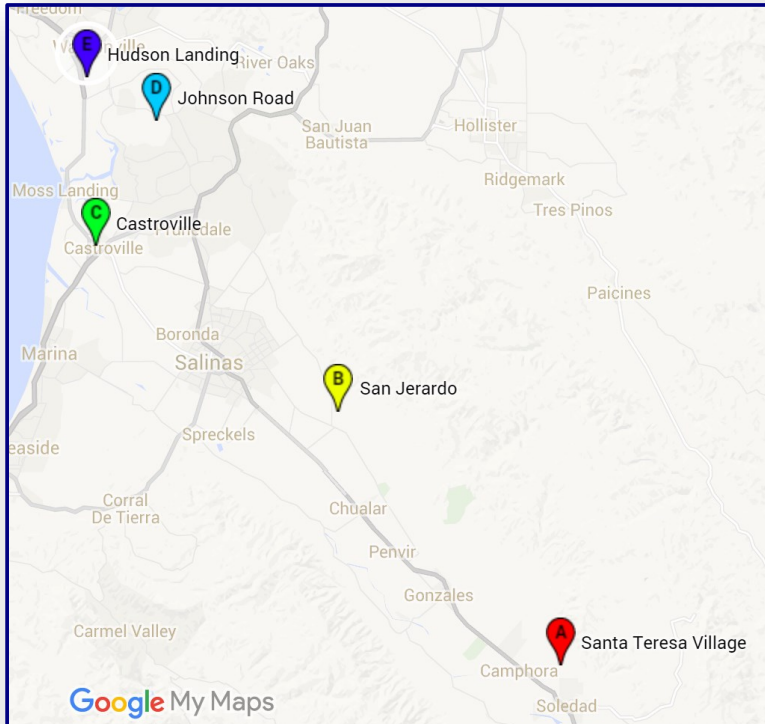
References:

- Environmental Justice Coalition for Water - <http://ejcw.org/>
- Central Coast Water Board - Environmental Justice
http://waterboards.ca.gov/centralcoast/water_issues/programs/enviro_justice/enviro_justice.shtml
- Water Code Section 106.3, Human Right to Water Law
<http://www.leginfo.ca.gov/cgi-bin/displaycode?section=wat&group=00001-01000&file=100-113>
- CalEPA - Environmental Justice - <http://www.calepa.ca.gov/envjustice/>
- Californians without Safe Water and Sanitation, California Water Plan Update 2013
<http://www.waterplan.water.ca.gov/>



SALINAS VALLEY ENVIRONMENTAL JUSTICE TOUR

Community Fact Sheet



The Salinas Valley EJ tour will highlight water justice concerns in five communities in Monterey County. You will visit one site in northern and southern Monterey County, and meet with representative members and advocates from each of the five sites. Please note your observations and insights throughout the tour.

South County Communities

Santa Teresa Village

- Santa Teresa offers housing to eight families that cannot alternatively afford to live in the adjacent city of Soledad. The families in the Santa Teresa Village are long-term tenants living in their individual houses or trailer homes and are able to enjoy the space to house pets and grow gardens. Residents of the Santa Teresa Village are concerned and very interested in making their drinking water safe to drink .

San Jerardo Cooperative

- In its 40 years, San Jerardo has demonstrated an inspiring resiliency in successfully overcoming safe water and adequate sanitation, among other challenges experienced by the housing cooperative. Members present today can speak to their past experiences, their motivation to continue to protect their community, and their current struggle to address affordability and democratic water governance.



North County Communities

City of Castroville

- Castroville is an unincorporated community big enough to be its own little city. Castroville, the artichoke capital of the world, is home to a majority of farm-worker families. These include long-term, multi-generational residents as well as short-term residents that follow the crops in California, Arizona, and other western states. The city's imminent risk of saltwater intrusion is expected to disproportionately impact farmworker communities, which make up most of Castroville.

Johnson Road

- A significant portion of the community includes farm-worker families that are long-term tenants of the Johnson Rd. area. These families cannot imagine moving out of the community despite of their lack of access to safe drinking water, as they would lose their affordable housing, among other valued features of their community.

Hudson Landing Road

- The Hudson Landing Road neighborhood is a small, rural neighborhood in North Monterey County that is home to long-term homeowners and tenants. In the past, some local residents took the initiative in pursuing a long term solution for their community-wide problems with nitrate contamination. Consolidation to the nearest public water system was pursued. Unfortunately, these efforts only discouraged residents as they found the option to consolidate to be unfeasible since the high financial cost that would fall on each homeowner was a major burden.

Observed Community Problems and Environmental Justice Issues

Use this space to capture environmental justice concerns, achievements, and any other observations significant to you.

Schroeter, Angela@Waterboards

From: Edo McGowan <edo_mcgowan@hotmail.com>
Sent: Thursday, March 03, 2016 1:17 PM
To: Edo McGowan; Schroeter, Angela@Waterboards
Subject: This came back as undelivered-----so just in case

Angela, many thanks. I will be discussing the connection between nitrates and adverse impacts on the immune system. Since the Salinas Valley is within the jurisdiction of your board and does use recycled on crops consumed raw, the whole of the topic warrants consideration. Would you see if I could be afforded some extra time to bring all this to the board? It is a complex issue and would require some integrated discussion. Who, within your staff might have the breadth to discuss this?

Cheers-----Edo

[Drinking-water nitrate, methemoglobinemia, and global burden of disease: a discussion](#)

L Fewtrell - Environmental health perspectives, 2004 - JSTOR

... He reported on two cases and concluded that methemo- globinemia may occur in an infant after ingestion of **water** high in **nitrates**, especially if the infant was suffering from a gastrointestinal disturbance (Comly 1945 ... **Nitrate**-related **drinking-water** methemo- globinemia ...

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[\[HTML\] from nature.com](#)

[Epidemiological evaluation of recurrent stomatitis, nitrates in drinking water, and cytochrome b5 reductase activity](#)

SK Gupta, RC Gupta, AK Seth, [AB Gupta](#)... - The American journal of ..., 1999 - nature.com

... Because dissolved organic matter may also absorb at 220 nm and **nitrates** do not absorb at ... nm, a second measurement at 275 nm was made to correct the **nitrate** values ... Because the samples were from **drinking water** sources, which had no organic interference, this method had ...

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[VOCs, pesticides, nitrate, and their mixtures in groundwater used for drinking water in the United States](#)

PJ Squillace, JC Scott, MJ Moran... - ... science & technology, 2002 - ACS Publications

... or synergistic interactions or may not interact at all because they affect totally different **systems** within the body (5 ... The purpose of this paper is to (1) describe VOCs, pesticides, **nitrate**, and their most common mixtures in untreated groundwater used for **drinking water** in the ...

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[Endocrine, immune, and behavioral effects of aldicarb \(carbamate\), atrazine \(triazine\) and nitrate \(fertilizer\) mixtures at groundwater concentrations](#)

JW Jaeger, IH Carlson, WP Porter - Toxicology and Industrial ..., 1999 - tih.sagepub.com
... 138 Page 7. Ž . Ž . Ž . Endocrine, **immune**, and behavioral effects of aldicarb carbamate ,
atrazine triazine and **nitrate** fertilizer mixtures Jaeger et al. Ž . Figure 4. Mean spleen weight
"1 SE for each of the **drinking water** pesticiderfertilizer mixtures. ...

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[Sub-chronic effec](#)

From: Schroeter, Angela@Waterboards <Angela.Schroeter@waterboards.ca.gov>
Sent: Wednesday, March 2, 2016 5:22 PM
To: Edo McGowan
Subject: RE: Up coming meeting in Santa Barbara----specifically Discussion/Informational Items # 18. Environmental Justice Update

Mr. McGowan –

Thank you for your comments regarding our March 2016 Board Meeting Item 18 – Environmental Justice Update. Staff will provide these comments to our Board as a supplemental sheet to the Item 18 Staff Report. The primary focus of Item 18 is nitrate impacts to drinking water in EJ areas and disadvantaged communities. However, you are welcome to attend the meeting to provide brief verbal comments to the Board. I will also forward your comments to the appropriate wastewater/recycled water staff. Please feel free to contact me if you have any questions.

Thank you

--

Angela Schroeter, P.G. | Senior Engineering Geologist
Central Coast Regional Water Quality Control Board
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www.waterboards.ca.gov/centralcoast



State Water Resources Control Board

www.waterboards.ca.gov

The State Water Resources Control Board web site covers California water quality and rights regulation, board meetings, laws, funding, watershed management ...

From: Edo McGowan [mailto:edo_mcgowan@hotmail.com]
Sent: Wednesday, March 02, 2016 5:11 PM
To: Schroeter, Angela@Waterboards; Edo McGowan
Subject: Re: Up coming meeting in Santa Barbara----specifically Discussion/Informational Items # 18. Environmental Justice Update

Angela, this is added background data. It is a note sent this day to staff at Food and Water Watch, but it is applicable to the issues included in Agenda Item # 18

Something over 1% of the Calif population falls into the HIV/AIDS category. In Santa Barbara County with a population of around 440,000, a 1.15% number represents (if my math is correct) about 5,000. Then, we have all the people on cancer drugs of other immune modulators. Often these people are, because of their illness, financially strapped. So, we really have a potential for arguing an environmental justice issue with recycled water which, as presently produced, pumps out interesting amounts of antibiotic resistant microbes and their antibiotic resistant genes (ARGs). The genes transfer resistance to the gut biota of these people. From there, resistance is then transferred to the blood, and could set up a basis for septicemia, consequently an internal reservoir, especially if that person houses some kind of prosthetic devise---example an indwelling high-pressure port, ICD, spinal screws, replaced hip joint, etc. Thus, the finding that dysbiosis may cause “up to a 1,300-fold increase of bacteria circulating in the blood” is a cause for worry (see paper below). So, what do we have here? As now produced, the recycled water carries significant numbers of ARGs and the community is being exposed by contact with lawns at parks, schools, college campuses and other areas now using recycled water. Further, we know that, as seen below---*Clostridium difficile* infections are a life threatening and a difficult to treat source of dysbiosis that often is caused by heavy use of antibiotics. Note---where do we find a heavy use of antibiotics? Why would this be necessary? With compromised immune systems (AIDS), the system can not or is capable of poorly defending itself. If sewer plants are a primary source of generated antibiotic resistant organisms, which they are (the US EPA's own studies demonstrated this back in the early 1980s) then there will be an issue with the use of poorly treated recycled water. We are introducing this water into the community and this is a problem. The increased exposure in a sensitive population may well translate into increased infection, hence requiring yet more treatment and that is generally via antibiotics. A revolving door. The material below is provided for engendering thought, hence conversation.

Any chance for some kind of discussion or answer?

Cheers-----Edo

@iStock.com

HIV is a disease of the gut, a concept that’s easy to lose sight of with all the attention paid to sexual transmission and blood measurements of the virus and the CD4+ T cells it infects and kills. But the bottom line is that about two thirds of all T cells reside in the lymphoid tissue of the gut, where the virus spreads after exposure, even before it shows up in blood.

Blood, however, has been the focus of research and care because it is easy to sample and broadly represents what is going on throughout the entire body. The gut is a lot harder to access, which is why much of it remains a crudely delineated terrain that can only be examined with blunt and invasive tools. But a better understanding of the gut environment will be necessary to achieve the next level of advances in

comprehending the disease and fashioning better interventions, researchers said last Wednesday at the annual Conference on Retroviruses and Opportunistic Infections in Boston. “Why do we care about the microbiome?” asked Nichole Klatt, a University of Washington (U.W.) pathobiologist, whose lab focuses on mucosal immunology. Klatt, who organized and chaired the conference session, answered her own rhetorical question, summarizing that HIV infection decreases the number and diversity of beneficial bacteria and increases those that have negative effects on the gut. “There are health consequences to dysbiosis,” she said. One main area of investigation, dysbiosis, is a perturbation of the microbiome that allows organisms inside the gut to escape through the gut barrier wall into surrounding space and eventually enter the bloodstream. Dysbiosis is a general process where various forms of disruption involving different microbes, at locations along the roughly nine meters of the intestinal tract are [likely to cause different medical problems](#).

Eight days after exposing monkeys to SIV, the simian equivalent of HIV, Adam Ericson, an immunologist at the University of Wisconsin–Madison saw “up to a 1,300-fold increase of bacteria circulating in the blood” of the animals. The temporal association—the number of bacteria increased in the blood before the SIV appeared in the blood—led him to believe that the virus first attacks CD4+ T cells that help protect the gut wall from microbial translocation. But then, as the animal's immune system began to exercise some control over the virus and gut barrier function improved, the level of bacteria in the blood declined. He suggests that modulating this activity might reduce the initial burst of inflammation that fuels HIV infection and the establishment of viral set points and the seeding of reservoirs.

Meanwhile on the Pacific Coast, Jennifer Manuzak, a U.W. immunologist, administered a probiotic called PBio to uninfected monkeys to modulate a more favorable microbial ecosystem in the gut and improve immune function. She found “an increase in IgG- [immunoglobulin-] producing B cells in both the colon and the lymph nodes” as well as an increase in T helper cells in the lymph nodes. These and other findings suggested that it is possible to enhance the immune response in the gut and could work as a way to increase immune responses to vaccination that typically are weaker in people infected with HIV, the elderly and other persons at risk. But Manuzak cautions against expecting commercially available probiotics to deliver the same results; there is simply no data to support that belief.

Just how does HIV infection affect the human gut microbiome? The answer may depend on where you look. Jesus Luevano, a medical student at Harvard Medical School and a researcher at the [Ragon Institute](#) examined bacterial communities from the gut of 145 people in Boston and 120 subjects in Uganda. He found very little difference between samples from the gut of HIV- positive and negative persons in Uganda, but a significant difference in Boston. Interestingly, the healthy HIV-negative Bostonians were the outliers, the guts of the other three groups was relatively similar; that was particularly true of untreated persons on both continents. “HIV-uninfected patients had much greater richness in their samples as well as a unique population that was primarily composed of bacteria from the phylum Firmicutes,” Luevano says. Viral load and treatment also had effects on community composition, but the number of persons in each subgroup of the study was too small to say anything more.

Fecal microbial transplantation (FMT) has gained acceptance for treating *Clostridium difficile* infection, a life threatening and difficult to treat dysbiosis that often is caused by heavy use of antibiotics. The procedure, which has a 90 percent success rate, transplants the fecal microbial ecosystem from a healthy person into a sick one, often using a colonoscope for inserting the material, to restore a healthy equilibrium.

Ma Somsouk, gastroenterologist from the University of California, San Francisco, hoped that an FMT might restore balance to the gut of HIV patients experiencing dysbiosis and immune activation that can lead to things like cardiovascular disease. After trying it in six patients Somsouk found there was little benefit. Luckily, the subjects experienced the same few side effects as other patients who have tried FMT. The main problem appeared to have been minimal engraftment—the transplanted organisms did not thrive and supplant the bugs that were already present and causing dysbiosis. Somsouk, however, was not surprised. With *C. difficile* a combination of antibiotics and massive diarrhea wipes out most of the bacteria in the gut, so the transplanted

organisms have little competition in colonizing the gut. Somsouk was transplanting his organisms into the microbial equivalent of Manhattan and most of them got lost in the crowd. The next phase of the study will first “condition” patients with antibiotics to knock down the local population of bacteria, as has already taken place in trying unsuccessfully to treat *C. difficile* patients, Somsouk says. It is similar to how radiation and chemotherapy are used to “condition” patients for a bone marrow transplant, to improve engraftment of transplanted immune cells. Somsouk thought all along that conditioning probably would be necessary to improve the changes of engraftment but he wanted to first try the less invasive approach using no antibiotics. He hopes to begin that second study in 12 patients later this year.

From: Schroeter, Angela@Waterboards <Angela.Schroeter@waterboards.ca.gov>
Sent: Monday, February 29, 2016 12:17 PM
To: Edo McGowan; monica.babich@gmail.com; JohnAckerman
Cc: Robertson, John@Waterboards
Subject: RE: Up coming meeting in Santa Barbara----specifically Discussion/Informational Items 18. Environmental Justice Update Prion

Mr. McGowan –

Thank you for your comments regarding our March 2016 Board Meeting Item 18 – Environmental Justice Update. Staff will provide these comments to our Board as a supplemental sheet to the Item 18 Staff Report. Please feel free to contact me if you have any questions.

Thank you

--

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From: Edo McGowan [mailto:edo_mcgowan@hotmail.com]
Sent: Monday, February 29, 2016 11:02 AM
To: Edo McGowan; Schroeter, Angela@Waterboards; monica.babich@gmail.com; JohnAckerman
Subject: Re: Up coming meeting in Santa Barbara----specifically Discussion/Informational Items 18. Environmental Justice Update Prion

Public parks

To: Angela Schroeter, CC RWQCB-----acknowledgement of receipt appreciated

Fm: Dr Edo McGowan

Re: Environmental Justice, and by extension, an addendum to CalEPA Complaint 46140, Feb 2, 2016

Dt: 2-29-16

An Environmental Justice issue, per this transmittal, warrants a discussion by your Board during the March meeting in Santa Barbara.

In spite of the apparent wealth attributed to Santa Barbara, we do have the potential for an environmental justice issue here with use of recycled water.

Santa Barbara, for all its beauty, is a hard town. There is an at-risk service-class. These are people with low wages, and many holding multiple part time jobs, often sans health insurance, and paying high rents---forced by economics to live in close-quartered often in over-crowded conditions. These issues as discussed herein are both public health as well as environmental justice issues.

There is also a high turnover in the food industry sectors that hire these workers, and thus those in this class may find short lived and infrequent employment. These temporary working-class residents, upon which many local businesses depend, do not belong to country clubs, may have no health insurance, and may have limited transportation which coincidentally limits their recreational opportunities. Thus, these people and their families frequent local parks. These parks have been irrigated with recycled water. As seen in the abstract from Chad Kinney's work below, as well as that from other sources noted herein, the CECs and pathogens coming through in the presumably finished and disinfected recycled irrigation water remain on surfaces and in soils.

This class of people, often living on the fringe, because of a number of issues, are more likely to let illnesses go as long as possible before seeking treatment, and then when things get critical seek help through the emergency services of the hospital. This also puts an unnecessary strain on local taxes as well as health facilities. In avoiding prompt treatment, during the interim, they attempt to maintain their work schedules. For those in the hotel and restaurant trades, this may expose visiting residents and guests to public health risks through contagion, contact, and disease transfer, hence to unnecessary health risks. That underlying situation additionally, has an array of adverse impacts on these people, hence the community, including the guests who come here for enjoyment. It is also important that disease transfer occurs while using crowded public transport systems, frequented by this socioeconomic class.

The City may believe that it is saving money by ignoring the associated social and environmental costs of producing inferior recycled water. After all, many of the pathogens noted in recycled water may not immediately cause an illness or infection and the tourist may well be back home before something untoward happens. Is that person likely to associate it with a trip to Santa Barbara? The transfer of antibiotic resistance to the human gut may not see an issue until an infection crops up and the treatment fails. Nonetheless, transfer via genes of resistance to antimicrobials sets up carrier states.

The point here is that there are and have been a sufficient number of warnings that would otherwise allow a more proactive and responsible city administration to consider these issues. I don't see that happening in Santa Barbara. Consequently, this should fall into the environmental justice arena something presumably within the jurisdiction of the your board and generally, the RWQCB.

Here is an augmentation that should be available to the panel for the meeting on **Friday, March 18, 2016**. This is not a new argument or one that had , in the main, failed to be presented to the CC RWQCB.

Since the 1950s, it has been well recognized that effluent from treatment works discharges resistant organisms. In 1981, the report based on a study by the US EPA confirmed this (<http://aem.highwire.org/content/43/2/371.full.pdf+html>). Thus, alerted to this fact, the City should have been proactive. It has not demonstrated such a stance. Lacking that stance, it did have a duty to warn and it seems to have also been reluctant to demonstrate even that. Then, sometime after the report by US EPA, in 2004, the City joined in study by WERF, (00-PUM-2T) the results of which echoed the 1981 US EPA study by pointing out that the standards in use did not protect public health. In discussions with the City, it was asked what it changed based on the WERF findings. The answer was that the City chose to not make changes. About this time I ran samples of water finding multi-drug resistant organisms in the City's recycled water. These findings were supplemented by tests run in the Medical Microbiology at SBCC by the late Dr Judy Meyer. Dr Meyer then had meetings with the City about this. That was in the middle of the last decade. Following those meetings it again appears that the City made no significant changes, if any changes. Then, in 2012, I participated in yet more testing, the results are noted below under Fahrenfeld's paper.

The City lately wishes to expand its recycled water system. Unfortunately, the indicated changes may fail to correct the underlying issue of dispersal into the public environment of pathogens, antibiotic resistance, antibiotic resistant genes, and contact with contaminants of emerging concern, the xenobiotics, thus reaching vulnerable public.

Thus, given the socioeconomic status of the above discussed worker class, this is an environmental justice issue needing to be addressed by the CC RWQCB.

[Abstract](#)
[Send to:](#)

[Environ Sci Technol](#). 2014 Aug 19;48(16):9079-85. doi: 10.1021/es502615e. Epub 2014 Jul 31.

High throughput profiling of antibiotic resistance genes in urban park soils with reclaimed water irrigation.

[Wang FH](#)¹, [Qiao M](#), [Su JQ](#), [Chen Z](#), [Zhou X](#), [Zhu YG](#).

[Author information](#)

Abstract

Reclaimed water irrigation (RWI) in urban environments is becoming popular, due to rapid urbanization and water shortage. The continuous release of residual antibiotics and antibiotic resistance genes (ARGs) from reclaimed water could result in the dissemination of ARGs in the downstream environment. This study provides a comprehensive profile of ARGs in park soils exposed to RWI through a high-throughput quantitative PCR approach. 147 ARGs encoding for resistance to a broad-spectrum of antibiotics were detected among all park soil samples. Aminoglycoside and beta-lactam were the two most dominant types of ARGs, and antibiotic deactivation and efflux pump were the two most dominant mechanisms in these RWI samples. The total enrichment of ARGs varied from 99.3-fold to 8655.3-fold compared to respective controls. Six to 60 ARGs were statistically enriched among these RWI samples. Four transposase genes were detected in RWI samples. TnpA-04 was the most enriched transposase gene with an enrichment was up to 2501.3-fold in Urumqi RWI samples compared with control soil samples. Furthermore, significantly positive correlation was found between ARGs and transposase abundances, indicating that transposase might be involved in the propagation of ARGs. This study demonstrated that RWI resulted in the enrichment of ARGs in urban park soils.

PMID:

25057898

[PubMed - in process]

Bacteria Making Meds in Wastewater Outflows

Saturday, 01 August 2015 00:00 By [Brian Bienkowski](#), [Environmental Health News](#) | Report

Wastewater treatment plants not only struggle removing pharmaceuticals, it seems some drugs actually increase after treatment.

When researchers tested wastewater before and after treatment at a Milwaukee-area treatment plant, they found that two drugs — the anti-epileptic carbamazepine and antibiotic ofloxacin — came out at higher concentrations than they went in. The study suggests the microbes that clean our water may also piece some pharmaceuticals back together. Carbamazepine and ofloxacin on average increased by 80 percent and 120 percent, respectively, during the treatment process. Such drugs, and their metabolites (formed as part of the natural biochemical process of degrading and eliminating the compounds), get into the wastewater by people taking them and excreting them. Flushing drugs accounts for some of the levels too.

"Microbes seem to be making pharmaceuticals out of what used to be pharmaceuticals," said lead author Benjamin Blair, who spearheaded the work as a PhD. student at the University of Wisconsin-Milwaukee. Blair is now a postdoctoral fellow at the University of Colorado Denver.

Blair and colleagues found 48 out of 57 pharmaceuticals they were looking for at the South Shore Water Reclamation Facility in Oak Creek, Wisconsin, which serves the greater Milwaukee area.

The researchers have a clue as to how this might happen: microbes.

After removing the solids from incoming wastewater, treatment plants use microbes — tiny single-celled organisms —

to decompose organic matter that comes in the sewage.

Blair's best guess is that people take the drugs, their body breaks them down into different metabolites that are excreted, and the microbes take these different parts of the drug and put them back together.

"It's a fascinating idea," Blair said.

Tanja Rauch-Williams, principal technologist at the environmental engineering company Carollo Engineers, said it was a strong study but cautioned that this doesn't mean wastewater treatment plants are acting as pharmaceutical factories.

"It's a large amount of pharmaceuticals that we [wastewater treatment plant researchers] look at, it's not a trend that the plants generate higher compound concentrations," she said. "It's very specific compounds."

She said that this apparent piecing back together of metabolites into pharmaceuticals could, in principle, also happen in the environment after effluent discharge.

It's not the first time researchers have noticed this trend. Canadian [researchers found](#) carbamazepine more than doubled its initial medicinal load after treatment at a Peterborough, Ontario, plant.

"When others have found this, people thought it was due to things like sampling errors," Blair said. "But we found a clear upward trend over time."

What remains unclear is why only certain drugs would increase post-treatment. Blair and colleagues saw the trend in just two of the 48 pharmaceuticals found in their wastewater samples.

"We need to look for what the structural or metabolic commonality is in these compounds. And then we could possibly predict whether some would increase [after treatment]," Rauch-Williams said.

Even with the increases, the pharmaceuticals are at levels far below what could impact humans if they consume the water, she said. But the ubiquity of the drugs in wastewater is a concern for fish and other aquatic creatures.

Carbamazepine, used as an anti-epileptic drug, impacted the enzymes in gills, livers and muscles of common carp, according to a [2011 study](#). Such enzyme changes are indicative of tissue damage and impaired cells. The drug also [has been linked](#) to endocrine disruption and reproductive problems in zebrafish.

Rauch-Williams said the wastewater industry is getting more efficient at removing pharmaceuticals. "Things like advanced oxidation, UV disinfection coupled with peroxide, different membrane processes ... these remove a large majority of these compounds," she said.

Blair said the drawback to many of the more effective treatments is expense. And there's no urgency for plants to upgrade because there aren't any U.S. regulations for pharmaceuticals in water, he added.

The U.S. Environmental Protection Agency evaluates substances that may be in drinking water by developing Contaminant Candidate Lists and periodically issuing a Regulatory Determination.

The EPA's latest drinking water contaminant candidate list — water pollutants not subject to regulations yet but that might render water unsafe — includes several pharmaceuticals that act on hormones.

[Science News](#)

News in Brief

[Pollution](#)

Recycled water may flood urban parks with dangerous germs With irrigation, drug resistance genes swamp the soil

By

[Beth Mole](#)

11:19am, July 30, 2014

DIRTY WATER Soil in urban parks that use reclaimed water for irrigation may have high numbers of drug-resistant microbes.

wiredtourist.com/flickr ([CC BY 2.0](#))

Sprinkling city parks with recycled water may create a breeding ground for hard-to-treat microbes. In a survey of parks in seven Chinese cities, researchers found that parks irrigated with treated wastewater were awash in signs of drug-resistant germs.

Even after the recycled water is treated in a sewage plant, it may carry microbes, drug-resistance genes and antibiotics

that had washed down the drain. Sprayed into the environment, that water can spread microbes that could cause difficult-to-treat infections, the researchers say.

[Appl Environ Microbiol.](#) 2005 Jun;71(6):3163-70.

Validity of the indicator organism paradigm for pathogen reduction in reclaimed water and public health protection.

[Harwood VJ¹](#), [Levine AD](#), [Scott TM](#), [Chivukula V](#), [Lukasik J](#), [Farrah SR](#), [Rose JB](#).

[Author information](#)

Abstract

The validity of using indicator organisms (total and fecal coliforms, enterococci, *Clostridium perfringens*, and F-specific coliphages) to predict the presence or absence of pathogens (infectious enteric viruses, *Cryptosporidium*, and *Giardia*) was tested at six wastewater reclamation facilities. Multiple samplings conducted at each facility over a 1-year period. Larger sample volumes for indicators (0.2 to 0.4 liters) and pathogens (30 to 100 liters) resulted in more sensitive detection limits than are typical of routine monitoring. Microorganisms were detected in disinfected effluent samples at the following frequencies: total coliforms, 63%; fecal coliforms, 27%; enterococci, 27%; *C. perfringens*, 61%; F-specific coliphages, approximately 40%; and enteric viruses, 31%. *Cryptosporidium* oocysts and *Giardia* cysts were detected in 70% and 80%, respectively, of reclaimed water samples. Viable *Cryptosporidium*, based on cell culture infectivity assays, was detected in 20% of the reclaimed water samples. No strong correlation was found for any indicator-pathogen combination. When data for all indicators were tested using discriminant analysis, the presence/absence patterns for *Giardia* cysts, *Cryptosporidium* oocysts, infectious *Cryptosporidium*, and infectious enteric viruses were predicted for over 71% of disinfected effluents. The failure of measurements of single indicator organism to correlate with pathogens suggests that public health is not adequately protected by simple monitoring schemes based on detection of a single indicator, particularly at the detection limits routinely employed. Monitoring a suite of indicator organisms in reclaimed effluent is more likely to be predictive of the presence of certain pathogens, and a need for additional pathogen monitoring in reclaimed water in order to protect public health is suggested by this study.

PMID:15933017[PubMed - indexed for MEDLINE] PMCID:PMC1151840 [Free PMC Article](#)

[Front Microbiol.](#) 2013 May 28;4:130. doi: 10.3389/fmicb.2013.00130. eCollection 2013.

Reclaimed water as a reservoir of antibiotic resistance genes: distribution system and irrigation implications.

[Fahrenfeld N¹](#), [Ma Y](#), [O'Brien M](#), [Pruden A](#).

[Author information](#)

Abstract

Treated wastewater is increasingly being reused to achieve sustainable water management in arid regions. The objective of this study was to quantify the distribution of antibiotic resistance genes (ARGs) in recycled water, particularly after it has passed through the distribution system, and to consider point-of-use implications for soil irrigation. Three separate reclaimed wastewater distribution systems in the western U.S. were examined. Quantitative polymerase chain reaction (qPCR) was used to quantify ARGs corresponding to resistance to sulfonamides (*sul1*, *sul2*), macrolides (*ermF*), tetracycline [*tet(A)*, *tet(O)*], glycopeptides (*vanA*), and methicillin (*mecA*), in addition to genes present in waterborne pathogens *Legionella pneumophila* (*Lmip*), *Escherichia coli* (*gadAB*), and *Pseudomonas aeruginosa* (*ecfx*, *gyrB*). In a parallel lab study, the effect of irrigating an agricultural soil with secondary, chlorinated, or dechlorinated wastewater effluent was examined in batch microcosms. A broader range of ARGs were detected after the reclaimed water passed through the distribution systems, highlighting the importance of considering bacterial re-growth and the overall water quality at the point of use (POU). Screening for pathogens with qPCR indicated presence of *Lmip* and *gadAB* genes, but not *ecfx* or *gyrB*. In the lab study, chlorination was observed to reduce 16S rRNA and *sul2* gene copies in the wastewater effluent, while dechlorination had no apparent effect. ARGs levels did not change with time in soil slurries incubated after a single irrigation event with any of the effluents. However, when irrigated repeatedly with secondary wastewater effluent (not chlorinated or dechlorinated), elevated levels of *sul1* and *sul2* were observed. This study suggests that

reclaimed water may be an important reservoir of ARGs, especially at the POU, and that attention should be directed toward the fate of ARGs in irrigation water and the implications for human health.

KEYWORDS:

antibiotic resistance genes; irrigation; reclaimed water distribution systems; water reuse
PMID:23755046[PubMed] PMCID:PMC3664959 [Free PMC Article](#)

<http://aem.highwire.org/content/43/2/371.full.pdf+html>

Several researchers have pointed out that wastewater, treated or untreated, is a primary contributor of bacteria to the aquatic ecosystem (12,16,17,20, 27,29). Studies have been conducted which demonstrate that significant numbers of multiple drug-resistant coliforms occur in rivers (17), bays (9), bathing beaches (28), and coastal canals (13). Waters contaminated by bacteria capable of transferring drug resistance are of great concern since there is the potential for transfer of antibiotic resistance to a pathogenic species. Available information shows that conventional wastewater purification methods without disinfection are not adequate for removal of antibiotic-resistant bacteria (14,15,29).
Wastewater Research Division, Municipal Environmental Research Laboratory,U.S.Environmental Protection Agency,Cincinnati, Ohio 45268 Received 15 June 1981/Accepted 13 October 1981.

[Environ Toxicol Chem.](#) 2006 Feb;25(2):317-26.

Presence and distribution of wastewater-derived pharmaceuticals in soil irrigated with reclaimed water.

[Kinney CA](#)¹, [Furlong ET](#), [Werner SL](#), [Cahill JD](#).

[Author information](#)

Abstract

Three sites in the Front Range of Colorado, USA, were monitored from May through September 2003 to assess the presence and distribution of pharmaceuticals in soil irrigated with reclaimed water derived from urban wastewater. Soil cores were collected monthly, and 19 pharmaceuticals, all of which were detected during the present study, were measured in 5-cm increments of the 30-cm cores. Samples of reclaimed water were analyzed three times during the study to assess the input of pharmaceuticals. Samples collected before the onset of irrigation in 2003 contained numerous pharmaceuticals, likely resulting from the previous year's irrigation. Several of the selected pharmaceuticals increased in total soil concentration at one or more of the sites. The four most commonly detected pharmaceuticals were erythromycin, carbamazepine, fluoxetine, and diphenhydramine. Typical concentrations of the individual pharmaceuticals observed were low (0.02-15 microg/kg dry soil). The existence of subsurface maximum concentrations and detectable concentrations at the lowest sampled soil depth might indicate interactions of soil components with pharmaceuticals during leaching through the vadose zone. Nevertheless, the present study demonstrates that reclaimed-water irrigation results in soil pharmaceutical concentrations that vary through the irrigation season and that some compounds persist for months after irrigation.

Edo McGowan

Suzanne Faubl <sfaubl@nwri-usa.org>; Helene Schneider <hshneider@santabarbaraca.gov>; Ben SBCK <ben@sbck.org>; John Ackerman <johnmackerman@gmail.com>; Cindy <cindy.feinberg@gmail.com>; supervisor carbajal@sbcbos1.org; Supervisor Carbajal@co.santa-barbara.ca.us <supervisorcarbajal@co.santa-barbara.ca.us>;

Suzanne-----thank you

Here is an augmentation that should be available to the panel for the meeting on this Wednesday. Since the 1950s, it has been well recognized that effluent from treatment works discharged resistant organisms. In 1981, the report based on a study by the US EPA confirmed this (<http://aem.highwire.org/content/43/2/371.full.pdf+html>). Thus, alerted to this fact, the City should have been proactive. It has not demonstrated such a stance. Lacking that stance, it did have a duty to warn and it seems to have also been reluctant to demonstrate that. Then, sometime after the report by US EPA, in 2004, the City joined in study by WERF, the results of which echoed the 1981 US EPA study by pointing out that the standards in use did not protect public health.

Here, we highlight advances that define the transmissibility of amyloid forms connected with Alzheimer's disease, Parkinson's disease and Huntington's disease. Collectively, these findings suggest that amyloid conformers can spread from cell to cell within the brains of afflicted individuals, thereby spreading the specific neurodegenerative phenotypes distinctive to the protein being converted to amyloid. Importantly, this transmissibility mandates a re-evaluation of emerging neuronal graft and stem-cell therapies

From: Edo McGowan <edo_mcgowan@hotmail.com>

Sent: Sunday, February 28, 2016 10:28 PM

To: edo_mcgowan@hotmail.com; monica.babich@gmail.com; JohnAckerman; Peter-RWQCB; harvey.packard@waterboards.ca.gov

Subject: Prion

To RWQCB, SLO, Re: addendum to complaint # 46140, Feb 2, 2016, on lack of proper environmental review by City of Santa Barbara (City) related to its recycled water.

It is common practice amongst mortuaries and undertakers to discharge withdrawn body fluids and contents to the drain, thence to sewer. The US EPA has determined that the treatment through a sewer plant has little to no effect of prions. Prions are transmissible, with long infection residue capacities, especially in soil. The topic of prions in recycled water was not adequately discussed, if discussed at all in the environmental considerations by the City. The proposed treatment train is unlikely to successfully remove prions from the finished and disinfected recycled water. This represents a potential adverse impact on the environment and on public health. Specific testing is warranted and the standard NPN coliform test is useless in this instance.

I would like a response on this from the RWQCB.

[J Infect Dis.](#) 2008 Jul 1;198(1):81-9. doi: 10.1086/588193.

Transmission and detection of prions in feces.

[Safar JG](#)¹, [Lessard P](#), [Tamgüney G](#), [Freyman Y](#), [Deering C](#), [Letessier F](#), [Dearmond SJ](#), [Prusiner SB](#).

[Author information](#)

Abstract

In chronic wasting disease (CWD) in cervids and in scrapie in sheep, prions appear to be transmitted horizontally. Oral exposure to prion-tainted blood, urine, saliva, and feces has been suggested as the mode of transmission of CWD and scrapie among herbivores susceptible to these prion diseases. To explore the transmission of prions through feces, uninoculated Syrian hamsters (SHas) were cohabitated with or exposed

to the bedding of SHas orally infected with Sc237 prions. Incubation times of 140 days and a rate of prion infection of 80%-100% among exposed animals suggested transmission by feces, probably via coprophagy. We measured the disease-causing isoform of the prion protein (PrP(Sc)) in feces by use of the conformation-dependent immunoassay, and we titrated the irradiated feces intracerebrally in transgenic mice that overexpressed SHa prion protein (SHaPrP). Fecal samples collected from infected SHas in the first 7 days after oral challenge harbored 60 ng/g PrP(Sc) and prion titers of approximately 10(6.6) ID(50)/g. Excretion of infectious prions continued at lower levels throughout the asymptomatic phase of the incubation period, most likely by the shedding of prions from infected Peyer patches. Our findings suggest that horizontal transmission of disease among herbivores may occur through the consumption of feces or foodstuff tainted with prions from feces of CWD-infected cervids and scrapie-infected sheep.

comment in [Prions' travels--feces and transmission of prion diseases](#). [J Infect Dis. 2008]PMID:18505383[PubMed - indexed for MEDLINE]PMCID:PMC2803675 [Free PMC Article](#)

- [Abstract](#)

[Send to:](#)

[PLoS One](#). 2009 Nov 24;4(11):e7990. doi: 10.1371/journal.pone.0007990.

Detection of sub-clinical CWD infection in conventional test-negative deer long after oral exposure to urine and feces from CWD+ deer.

[Haley NJ](#)¹, [Mathiason CK](#), [Zabel MD](#), [Telling GC](#), [Hoover EA](#).

[Author information](#)

Abstract

BACKGROUND:

Chronic wasting disease (CWD) of cervids is a prion disease distinguished by high levels of transmissibility, wherein bodily fluids and excretions are thought to play an important role. Using cervid bioassay and established CWD detection methods, we have previously identified infectious prions in saliva and blood but not urine or feces of CWD+ donors. More recently, we identified very low concentrations of CWD prions in urine of deer by cervid PrP transgenic (Tg[CerPrP]) mouse bioassay and serial protein misfolding cyclic amplification (sPMCA). This finding led us to examine further our initial cervid bioassay experiments using sPMCA.

OBJECTIVES:

We sought to investigate whether conventional test-negative deer, previously exposed orally to urine and feces from CWD+ sources, may be harboring low level CWD infection not evident in the 19 month observation period. We further attempted to determine the peripheral PrP(CWD) distribution in these animals.

METHODS:

Various neural and lymphoid tissues from conventional test-negative deer were reanalyzed for CWD prions by sPMCA and cervid transgenic mouse bioassay in parallel with appropriate tissue-matched positive and negative controls.

RESULTS:

PrP(CWD) was detected in the tissues of orally exposed deer by both sPMCA and Tg[CerPrP] mouse bioassay; each assay revealed very low levels of CWD prions previously undetectable by western blot, ELISA, or IHC. Serial PMCA analysis of individual tissues identified that obex alone was positive in 4 of 5 urine/feces exposed deer. PrP(CWD) was amplified from both lymphoid and neural tissues of positive control deer but not from identical tissues of negative control deer.

DISCUSSION:

Detection of subclinical infection in deer orally exposed to urine and feces (1) suggests that a prolonged subclinical state can exist, necessitating observation periods in excess of two years to detect CWD infection, and (2) illustrates the sensitive and specific application of sPMCA in the diagnosis of low-level prion infection. Based on these results, it is possible that low doses of prions, e.g. following oral exposure to urine and saliva of CWD-infected deer, bypass significant amplification in the LRS, perhaps utilizing a neural conduit between the alimentary tract and CNS, as has been demonstrated in some other prion diseases.

PMID:19956732[PubMed - indexed for MEDLINE]PMCID:PMC2776529[Free PMC Article](#)

[Persistence of the bovine spongiform encephalopathy infectious agent in sewage.](#)

Maluquer de Motes C, Espinosa JC, Esteban A, Calvo M, Girones R, Torres JM.

Environ Res. 2012 Aug;117:1-7. doi: 10.1016/j.envres.2012.06.010. Epub 2012 Jul 7.

PMID:

22776326

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Ding N, Neumann NF, Price LM, Braithwaite SL, Balachandran A, Belosevic M, El-Din MG.

Appl Environ Microbiol. 2012 Feb;78(3):613-20. doi: 10.1128/AEM.06791-11. Epub 2011 Dec 2.

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Maluquer de Motes C, Simon S, Grassi J, Torres JM, Pumarola M, Girones R.

J Appl Microbiol. 2008 Nov;105(5):1649-57. doi: 10.1111/j.1365-2672.2008.03916.x.

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Hinckley GT, Johnson CJ, Jacobson KH, Bartholomay C, McMahon KD, McKenzie D, Aiken JM, Pedersen JA. Environ Sci Technol. 2008 Jul 15;42(14):5254-9.

PMID:

18754377

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[Prion potential in biosolids.](#)

Outreach and Education Subcommittee, WEF Residuals & Biosolids Committee.

Water Environ Res. 2006 Apr;78(4):339. No abstract available.

PMID:16749301[Similar articles](#)

One study done by Yale University showed that 13% of Alzheimer's patients were found upon autopsy to actually have CJD.¹⁴ The inset web address is a discussion within the mortuary industry discussing prions (<http://www.rense.com/general52/um.htm>)

[Funeral Directors And Embalmers Admit Discharge Of Human ...](#)

www.rense.com

Funeral Directors And Embalmers Admit Discharge Of Human Prions Into Public Sewers 4-27-4

Of the 320 million people in the US, there are 5.3 million Americans with Alzheimer's or 1,6% Most are over 65. That means in communities with an aging population, more are likely to have Alzheimer's. Given the population in SB County, around 6,000 persons may have Alzheimer, and of these 13% may have prion disease, or perhaps 1000 people. If one adds in other prion-like diseases with the transmission possibility, the number hoes up.

Here, we highlight advances that define the transmissibility of amyloid forms connected with Alzheimer's disease, Parkinson's disease and Huntington's disease. Collectively, these findings suggest that amyloid conformers can spread from cell to cell within the brains of afflicted individuals, thereby spreading the specific neurodegenerative phenotypes distinctive to the protein being converted to amyloid. Importantly, this transmissibility mandates a re-evaluation of emerging recycled water standards.