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# **2020 Year in Review**

Over-application of nitrogen fertilizers (even in small amounts) can cause "groundwater contamination" and impair the use of local groundwater supplies for drinking water.

Yet, this is an essential crop input that is necessary so that Central Valley agriculture can continue to meet the need of a growing global population. Many ask if there is an expectation that we stop using nitrogen crop nutrients all together. While it may feel like this at times, the simple answer: No!

Surprising to many is that state water quality regulators are the first to respond "no," but the answer is then qualified with an explanation (often filled with regulatory terms) that puts forward constraints that are "black letter law." A response I've heard though the years in various contexts: "No, we don't want to ban nitrogen crop nutrients, but excess nitrate not used by the crop that moves past the root zone can cause or contribute to contamination of drinking water sources. That's against the law."

To address the Water Board's actual and perceived constraints regarding nitrogen, a nearly 15-year long stakeholder process, that includes the Water Board regulators, led to changes in regulations. These changes give the Water Board more flexibility and allows them to not find that excess nitrate is "against the law." Other stakeholders in this process include fellow "nitrate dischargers" such as dairy, cities and food processors. Also participating are advocates for Environmental Justice.

The Nitrate Control Program (NCP) is the agreement (or change in regulation) that stakeholders settled on to address this seemingly insurmountable problem of an essential crop input also being a source of groundwater contamination.

The NCP itself is a complicated regulation but key elements are simple: agriculture, dairies and other nitrate dischargers may receive up to 35 years to meet nitrate limits for protecting groundwater aquifers. In exchange for this extended time period, dischargers (working collectively) may combine efforts and resources to provide interim water supplies in the form of replacement water for residences whose wells are contaminated with nitrate.

The task of providing replacement water is to be accomplished through "Management Zones," six of which

have been identified as highest priority in the Central Valley (see page 8 for a list). These Management Zones, already in the works, must assess their participants to pay for development of detailed action plans and providing interim safe drinking water to impacted residences in the first instance and then look for longer term solutions. The replacement water activities must begin by mid-2021.

Over the longer term (i.e., 35-year timeline), irrigated agriculture will need to show significant progress in reducing or eliminating to the extent feasible excess nitrate movement past the root zone. That effort has already begun in the form of nitrogen application reporting through the INMP or Irrigation and Nitrogen Management Plans (see page 13). An indication of excess nitrogen applications is assessed through use of nitrogen crop coefficients which are part of an analysis used by Coalition consultants of nitrogen applied each year to crops (see page 13). Outlier parcels are first to come under scrutiny based on three years of nitrogen use data showing potential excess applications compared to other fields planted to the same crop (see page 14).

A separate and equally complex charge for agriculture is developing an approach to measure progress in improving water quality as it relates to nitrate contributions across larger geographic areas. Because a single farm or field doesn't give a clear indication of nitrate impacts to a very transient aquifer, Central Valley (CV) coalitions are required to develop township-level "Groundwater Protection Targets" (see page 17). These are based on a recently proposed "formula" that will be usable throughout the CV. Each coalition will then use township-specific information in that formula to produce a "value" which is an estimate of potential impacts of irrigated agriculture in that township. That value will then be compared to a yet-to-be-developed "target." How much, if any reductions in Nitrogen use that need to occur across each township remains to be determined. The answer will inform us if one of our most valuable crop inputs is in fact, contaminating the aquifers under these townships.

Stay tuned.

Parry Klassen Executive Director 209-846-6112 or contactesj@esjcoalition.org

# **Coalition Overview**

New Board Members Seated; More Volunteers Needed

Proposed amendments to the ESJWQC bylaws were approved by a member vote in early 2020, changing the future make-up of the Board of Directors. The approved changes are:

- The total number of director positions has been increased from 9 to 11;
- 6 directors will be elected by the voting members 2 each from Madera, Merced and Stanislaus counties;
- 5 directors will be appointed by the Board.

In September 2020, a mailing was sent to the membership solicitation nominations for the Board positions representing the three major counties encompassed by ESJWQC. While many calls were subsequently received seeking more information about the duties and responsibilities, only three applications were received by the November 30 deadline.

On January 14, 2021, a ballot was mailed to all members that included all three nominations. Three current board members were willing to continue their roles resulting in the two seats per county each having the needed candidates (2). There is also space for candidate write-ins for each county. The candidates will be notified of the results in late February.

#### CHALLENGE OF FINDING BOARD MEMBERS

In the last 17 years of ESJWQC's operation, the organization has struggled to find growers willing to serve on the Board of Directors. In this last effort to seek nominations, letters were sent to our 3000-plus members requesting candidates for the board seats. We received a total of three applications. It's certainly understandable with all growers' busy schedule that fitting one more responsibility onto their already overflowing plate is a step too far. But unlike most other farm organizations, ESJWQC directly represents growers to a State regulatory agency that has oversight of important farming inputs and activities.

Oversight of farm inputs i.e. nitrogen fertilizer applications – is greatly expanding the reach of government "involvement" in our farming operations. Unlike our pesticide applicator permits and pest control licenses, this regulatory program allows direct involvement in development and implementation of requirements. That involvement by the Central Valley coalitions, its boards of directors, staff and consultants, has played an important role in shaping the form of those regulations over the last 17 years. While we are not always successful, this ability to actively influence development and implementation has led to far less onerous regulations than if we didn't exist. Just look at what is happening now with the Central Coast Water Board regulations where an active third-party coalition does not exist. Fertilizer limits for all crops is near adoption in the years ahead.

Taking a board seat on ESJWQC is not committing time to "just another volunteer farm organization." The Irrigated Lands Regulatory Program in coming years faces some incredible challenges as the Nitrate Control Program (see page 9) and evaluation of nitrogen fertilizer use on crops enters into its next phases and attracts more scrutiny. ESJWQC needs the best and brightest minds in the industry to help guide the organization to meet these challenges.

#### TERMS OF ESJWQC BOARD MEMBERS

Board members in open seats covering the three counties serve three years so the vote in progress now will lead to terms extending through 2023. However, board members occasionally resign mid-term for health or business reasons, so vacancies periodically occur.

Contact ESJWQC staff or existing board members (see back page) if you are interested in learning more about the participation on the Board of Directors.

#### **VOTING MEMBERSHIP**

As of January 2021:

- 3,291 landowner/operators
- 702,618 irrigated acres

#### BOUNDARIES

The Coalition area includes Madera County and portions of Stanislaus, Merced, Tuolumne and Mariposa counties.



# **Financial Overview**

Reported below is a financial overview presenting the ESJWQC 2019 audited financial statement numbers, and 2020 current income and expenses compared to budgeted amounts. As of December 31, 2020, there was approximately \$1.04 million in ESJWQC banking accounts. A complete financial statement of 2020 expenditures is available upon request.

ESJWQC has contracted the services of Atherton & Associates, LLP, located in Modesto, to perform an audit of our financial statement for calendar year 2019. The CPA firm reported that the ESJWQC financial statements were "fairly presented in conformity with U.S. general accepted accounting principles." The audit report and audited financial statements are available upon request.

#### SUMMARY OF FINANCIAL ACTIVITIES

Audited January 1, 2019 thru December 31, 2019, and January 1, 2020 thru December 31, 2020 Current vs. Budget:

|                      | Audited<br>2019, \$K<br>(Thousands) | Current*<br>2020, \$K<br>(Thousands) | Budget<br>2020, \$K<br>(Thousands) | Description   |
|----------------------|-------------------------------------|--------------------------------------|------------------------------------|---|
| Total Income         | \$ 3,274                            | \$ 3,192                             | \$ 3,045                           | Membership dues plus interest on bank<br>accounts in 2020   |
| Expenses             |                                     |                                      |                                    |   |
| Program              | 3,347                               | 3,750                                | 3,623                              | Program manager, State Ag Waiver fees, site<br>monitoring/special studies, quality control/<br>assurance, executive director, membership<br>management and correspondence, BMP<br>assessment, and contractors doing work for<br>the Coalition |
| Organizational       | 164                                 | 225                                  | 304                                | Insurance, legal, accounting, meetings, website, and miscellaneous business costs   |
| Total Expenses       | 3,511                               | 3,975                                | 3,927                              |   |
| Net Income<br>(Loss) | \$ (237)                            | \$ (783)                             | \$ (882)                           | Difference between Total Income and<br>Total Expenses   |

\* Current 2020 includes an estimate of the 2020-2021 State Ag Waiver Fee that will be received February 2020.



# Dues Increase Reflects Expanded Program Requirements

New Rate of \$5.50 per Acre

It was with much head-shaking and sometimes tense discussions that the ESJWQC Board of Directors reluctantly approved the 2021 member dues rate of \$5.50 an acre on September 28, 2020. In the past 2-3 years, ILRP regulatory requirements have increased and the Board has relied on reserves and new members (due to Regional Water Board enforcement) paying significant back dues to keep the acreage fee at \$4 an acre despite additional costs. For the 2021 dues level, the Board of Directors had to make the difficult decision to increase dues as additional regulatory initiatives continue rolling out and past sources of revenue are not available.

The biggest impact to the 2021 budget is reduced revenue and less reserves available. In 2020, new memberships were lower than years past. Also, a portion of the reserves were used in 2020 to pay irrigated agriculture's share of the first installment to form and prepare required reports for the Nitrate Management Zones in the Modesto, Turlock and Chowchilla groundwater basins (see page 10).

| Year | New<br>Applicant<br>Acreage | Backdues/<br>Interest<br>Received | Late Fees/<br>Reinstatement<br>Fees |
|------|-----------------------------|-----------------------------------|-------------------------------------|
| 2015 | 7,351                       | \$133,440.88                      | \$4,714.27                          |
| 2016 | 3,223                       | \$141,516.86                      | \$2,645.96                          |
| 2017 | 5,464                       | \$187,626.92                      | \$24,428.40                         |
| 2018 | 1,248                       | \$55,506.87                       | \$16,338.36                         |
| 2019 | 4,567                       | \$247,888.63                      | \$18,029.12                         |
| 2020 | 868                         | \$37,005.30                       | \$15,325.00                         |

After increased State Water Board fees, new programs and expansion of existing programs, the overall 2021 program costs are expected to be \$4.1 million compared to \$4 million in 2020. As a result of fewer new acres (and associated back dues) and the lowering of reserves for new regulatory requirements, the Board was forced to increase the dues to the higher per acre rate. The following is a review of the major 2021 programs driving this increase.

#### COST SHARING WITH CENTRAL VALLEY COALITIONS

Central Valley Coalitions have joined forces to split costs to fund some program elements to save money, but the new regulatory initiatives are costly. Unfortunately, these costs are likely to remain in place for the foreseeable future meaning that dues will remain higher than in years past. Further, members in the Modesto, Turlock and Chowchilla Management Zones are receiving supplemental invoices in 2021 ranging from \$2.20 to \$3.35 per acre to cover irrigated agriculture's portion of Nitrate Control Program costs. In 2022 or 2023, members in the Merced and Madera groundwater basins (where Management Zones will be required next) are expected to also face supplemental dues to cover the costs for the Nitrate Control Program. (see page 9)

#### STATE WATER BOARD FEE INCREASE

Fees to the State Water Resources Control Board (State Water Board) were set in the Governor's 2020-21 fiscal year budget at \$1.12 an acre. In 2019, the rate was 87 cents per acre; in 2020, \$1.08 per acre. The trend is obvious. The increases are due to the State Water Board's increased costs for personnel to implement the Irrigated Lands Regulatory Program, which are then passed on to agriculture to pay for the program. All growers in Central Valley water quality coalitions are assessed the same per acre fee.

#### **GROUNDWATER PROTECTION TARGETS**

Central Valley coalitions spent much of 2019 and 2020 evaluating approaches for determining the impact of nitrogen fertilizer use on groundwater aquifers across townships in high vulnerability areas. After much evaluation, a modeling approach was selected as the most cost-effective method to make those determinations (see



page 17). The model and reporting of model results is expected to cost more than \$611,000, an amount that is being split between the 13 Central Valley coalitions based on acres covered by each organization. The ESJWQC share: \$101,250 for 2021.

#### NEW SALT CONTROL PROGRAM

The "CV SALTS Basin Plan amendments" which were developed through a long stakeholder process, include a phased program to deal with salt accumulation in the Central Valley. Rather than require immediate action similar to the Nitrate Control Program, it allows agriculture, dairies, cities and industry to undertake a 10-year, \$10 million "Prioritization and Optimization" study. Irrigated agriculture's annual portion of that study is \$496,182; ESJWQC share in 2021 is \$77,689.

#### **EFFORTS TO REDUCE EXPENSES**

As the 2021 program increases became apparent, the Board of Directors examined every element of the budget to see where savings could be realized. Because staff and consultant workloads were expected to increase in 2021, the Board decided to shift some membership management activities to the county Farm Bureaus (Stanislaus, Merced and Madera) whose staff are paid lower hourly rates than coalition consulting firms. While the three Farm Bureaus' combined budget increases from \$365,000 in 2020 to \$470,000 in 2021, their new responsibilities allowed the finance committee to reduce the original proposed budget for 2021 by over \$195,000. In coming years, cost savings are expected to increase once the consulting firms finish training Farm Bureau staff and membership management activities become more efficient.

Another step taken by the Board was to decrease budget reserves. Overall reserves for 2021 are reduced to three months of average annual expenses versus the previous practice of holding budget reserves equal to six months of average expenses.

Notably, the Coalition Board continues its diligent efforts to protect irrigated agriculture from legal challenges that could further increase program costs and make farming even more difficult. For example, environmental activists challenged the 2018 ESJWQC Order because they believed it wasn't stringent enough. Through the leadership of the Coalition's legal counsel, who worked closely with legal counsel for other coalitions and agricultural organizations, a Sacramento Superior Court judge rejected three separate challenges that collectively sought to remove the anonymous protections of member nitrogen application information and farm practices and claimed that the ESJWQC Order did not comply with certain state policies. We anticipate that the Sacramento Superior Court decision will be appealed by the environmental activists.

The ESJWQC Board is continuing its efforts to ensure that farmers can grow their crops using effective management practices to minimize or eliminate impacts of farm inputs to surface water and groundwater.







# **ESJWQC Web Portal**

Your Online Membership Management Tool

#### Web Address: www.esjmemberlogin.com

#### Get Started with 3 Easy Steps:

**Step 1.** Request a passcode by emailing ESJWQC staff at contactesj@esjcoalition.org or call (209) 846-6112.

**Step 2.** Navigate to website at address above

Login using your email address and passcode. Personalize your passcode after logging in.

#### MEMBER PORTAL OPENING PAGE PORTAL OVERVIEW \*New\*

- 1. Subscribe for Live ETo Data (additional service fee)
- 2. Nitrogen Evaluation Full Packet Available
- 3. Irrigation and Nitrogen Management Plan Online Worksheet
- Real time and efficient data tracking
- Input nitrogen applications throughout the year
- Import INMP worksheet information into your INMP Summary Report



**Features:** 



# Rollout of CV Salts Program Begins for Nitrate and Salt Control

A Basin Plan Amendment\* (BPA) covering nitrate and salt discharges from agriculture, industry and public agencies was adopted by the State Water Resources Control Board on October 16, 2019. ESJWQC representatives along with others regulated by Waste Discharge Requirements (WDRs) and environmental stakeholders participated in development of the regulatory framework that will shape nitrate and salt regulations for decades to come. In December 2020, targeted revisions directed by the State

Water Board were adopted by the Central Valley Water Board. However, they did not substantially change the content of the original BPA.

In 2020-21, key elements of the salt and nitrate control programs were rolled out. The Salt Control Program (SCP) has two options for compliance: meet conservative salt discharge limits or participate in a

10-year Prioritization and Optimization Study to identify regional solutions. ESJWQC and most permit holders are choosing the latter option. In January 2021, a Notice to Comply for this program was sent to all dischargers in the Central Valley with salt included in their permits. The only compliance steps needed to participate in the Prioritization and Optimization study is cost-sharing with other entities to fund the 10-year study (see page 6).

For the Nitrate Control Program (NCP), the Notice to Comply was received by ESJWQC and other dischargers in February 2020. The program sets a series of new requirements for certain prioritized areas.

Irrigated agriculture faces a particular dilemma with nitrate: numerous studies show that it is virtually impossible to meet the nitrate drinking water standard (10 mg/l) below the root zone when applying nitrogen fertilizers to crops. While some practices show promise for minimizing nitrate leaching to groundwater, agriculture in many parts of the Central Valley is not able to meet the 10-year time frame for compliance with the drinking water standard mandated by the current WDR. If the timeframe can't be met, the Central Valley Water Board would be forced to either adopt discharge limits that are equal to the drinking water

\*Amendments to Water Quality Control Plans for Sacramento River and San Joaquin River Basins and Tulare Lake Basin to Incorporate a Central Valley-Wide Salt and Nitrate Control Program. BPA developed through a stakeholder process called CV-Salts (Central Valley Alternatives for Long-Term Sustainability). More details on pages 9-10.

standard or issue Prohibition of Discharge against nitrate discharges that do not meet the standard.

Key to the new NCP is now Central Valley Water Board has the flexibility to give agriculture and other dischargers up to 35 years to meet the nitrate water quality standard in discharges to groundwater. In exchange for the exception for meeting nitrate standards over the longer timeframe, WDR holders in priority basins must show that communities

and others that rely on groundwater for their drinking water have access to drinking water that meets nitrate standards. The BPA mandates implementation of these provisions through a cooperative approach referred to as Management Zones. In addition to providing access to safe drinking water, Management Zone participants must also show how nitrate discharges to groundwater are being managed.

In addition to ESJWQC, other WDR permit holders participating in Management Zones include dairies, wineries, poultry operations, cities and food processors.

Six priority basins for Management Zones were identified in the Central Valley through evaluation of existing groundwater nitrate levels. Of the six basins (Chowchilla, Kaweah, Kings, Turlock, Tule, and Modesto), three are located in the ESJWQC region (see maps pages 11-12).

In September 2020, the ESJWQC Board of Directors directed start-up funding to two entities to begin implementation of the Management Zone requirements. Valley Water Collaborative (www.valleywaterc.org) encompasses the Modesto and Turlock basins Management Zones. Madera County Farm Bureau is managing the Chowchilla basin Management Zone until the dischargers in the area (agriculture, dairy and cities) decide if another entity needs to be formed.





# New Nitrate Control Program

History and Program Progress to Date

#### NITRATE CHALLENGE IN THE CENTRAL VALLEY

Over the last 150 years, increased agricultural, industrial, and municipal activities, coupled with population growth, have resulted in dramatic increases in nitrates in groundwater in the Central Valley. Many small communities in the Central Valley rely on groundwater for drinking water. Some communities can't safely use groundwater for drinking water as nitrate levels present a potential for human health impacts. The Central Valley Regional Water Quality Control Board (Regional Board) regulates nitrate discharges to groundwater from these activities. Improved management practices have been implemented to reduce nitrate discharges, but compliance with current regulations is difficult if not impossible. New, updated regulations have been developed through the CV-SALTS initiative.

#### **CV-SALTS INITIATIVE**

The CV-SALTS (Central Valley Salinity Alternatives for Long-Term Sustainability) was formed more than a decade ago as a collaborative stakeholder group tasked with developing a sustainable salt and nitrate management program for the Central Valley. In 2008, the Central Valley Salinity Coalition was established to help fund the needed scientific and technical studies.

#### NEW NITRATE CONTROL PROGRAM

On May 31, 2018, the Regional Board approved amendments to the Central Valley's Water Quality Control Plans or Basin Plans which include the new Salt and Nitrate Control Programs. On October 16, 2019, the State Water Resources Control Board (State Board) also approved the amendments. The Office of Administrative Law approved the amendments in January 2020.

#### NITRATE CONTROL PROGRAM GOALS

- Provide safe drinking water supplies as the priority.
- Reduce nitrate impacts to water supplies.
- Restore groundwater quality.

The Nitrate Control Program is a prioritized program. The Regional Water Board is implementing the Nitrate Control Program beginning with the identified Priority 1 groundwater basins/subbasins of Kaweah, Turlock, Chowchilla, Tule, Modesto and Kings. In February 2020, Notices to Comply were mailed to nitrate dischargers in those basins. Priority 2 groundwater basins /subbasins are Yolo, Merced, Kern County (west side south), Tulare Lake, Kern County (Peso), Delta Mendota, Eastern San Joaquin and Madera. Notices to Comply will be mailed between 2022 and 2024.

The Nitrate Control Program provides the Regional Water Board with revised, more flexible authorities for nitrate regulation, including:

- Exceptions for dischargers in meeting the nitrate water quality objective,
- Establishment of management zones to foster collaborative nitrate solutions, and
- Offset Projects for groundwater as an alternative means of achieving compliance with Waste Discharge Requirements (WDRs).

# TWO NITRATE COMPLIANCE PATHWAYS FOR DISCHARGERS TO CHOOSE

Once nitrate dischargers receive a Notice to Comply with the Nitrate Control Program, they have a choice of two pathways for compliance -- Pathway A – Individual Permitting or Pathway B – Local Management Zone. After receiving a Notice to Comply, dischargers must choose a pathway.

Pathway A: Individual Permitting Approach A discharger or groups of dischargers subject to a single order may opt to comply under the individual permit requirements that:

- Defines requirements to protect shallow groundwater,
- Establishes five discharge categories and associated compliance requirements, and
- Establishes trigger levels for consideration.

When applicable, dischargers opting for Pathway A may also need to ensure that those impacted by nitrates have safe drinking water.



#### PATHWAY B: MANAGEMENT ZONE PERMITTING APPROACH

For those dischargers that cannot meet the Pathway A more conservative approach, they must use Pathway B. Dischargers opt to work collectively with other dischargers through a management zone. The management zone is a defined area, e.g., a portion of a larger groundwater basin/subbasin. A management zone serves as a discrete regulatory compliance unit for nitrate compliance. Dischargers would ensure that those impacted by nitrate have safe drinking water within the zone while continuing to implement best practices and nitrogen management plans. In turn, dischargers may be allowed greater flexibility and more time to achieve nitrogen balance and restore nitrate-affected water bodies.

The ESJWQC Board of Directors, on behalf of its membership, chose to participate in Pathway B to comply with the NCP. They realized that joining a management zone offered several key benefits, in particular working together with other dischargers to achieve compliance.

#### EARLY ACTION PLANS

An EAP includes specific actions and an implementation schedule to address the immediate needs of those with groundwater that exceeds the nitrate drinking water standard. EAPs will ensure that the first goal of the Nitrate Control Program—to address drinking water issues is achieved by allowing participants to work together regionally to meet this need, saving money and sharing costs as locally appropriate.

#### MANAGEMENT ZONE PROGRAMS FOR MODESTO, TURLOCK AND CHOWCHILLA BASINS

Valley Water Collaborative (VWC) is a non-profit organization set up to organize and operate the Modesto and Turlock basins' Management Zones. VWC's 12-member board of directors represents agriculture, including dairies and poultry facilities, cities, wineries and food processors. ESJWQC holds three board seats. The new organization will combine the resources and expertise of its member organizations to ensure that all residents in the Modesto and Turlock basins whose wells are impacted by nitrate have access to safe drinking water. Its first deliverable due on March 8 is the EAP and Preliminary Management Zone Plan. www.valleywaterc.org

In the Chowchilla basin, the dischargers have entered into a Memorandum of Agreement (MOA) allowing Madera County Farm Bureau (MCFB) to facilitate and coordinate the efforts of the Chowchilla Management Zone. Dischargers participating in the Chowchilla Management Zone have developed a plan that will ensure all residents impacted by nitrates have access to safe drinking water. The group is currently governed by a 7-member steering committee with representatives from agriculture, including irrigated cropland and dairy, the City of Chowchilla, composting/sludge and poultry facilities. The Chowchilla Management Zone is also on schedule to meet the March 8 deliverable deadline. www.maderacountywater.com/cvsalts/







# **Modesto and Turlock Sub-basins Management Zones**



# **Chowchilla Sub-basin Management Zone**





# 2020 Nitrogen Reporting

#### **REPORTING FROM START TO FINISH**

**Step 1:** Return your Irrigation and Nitrogen Management Plan (INMP) Summary Report to the Coalition by March 1 by using the Member Portal (see Page 7) or returning the completed hard copy.

**Step 2:** The distribution (bell curve) of the amount of nitrogen applied and removed is created for each crop in the Coalition region based on reported information.

**Step 3:** The amount of nitrogen applied and removed for your field(s) is compared to other fields in the Coalition region with the same crop.

**Step 4:** Thresholds are statistically calculated and outliers are determined if the nitrogen applied and removed is above the threshold.

**Step 5:** You receive a Nitrogen Evaluation Packet from the Coalition with the distribution curve, your data marked on the curve and notification of fields designated as outliers.

#### **N-EVALUATION PACKET INFORMATION**

#### Purpose

The Coalition analyzed information provided on 2019 INMP Summary Reports submitted by growers in Spring 2020. The analysis compares your nitrogen applications to other Coalition members who grow the same crop.

#### What's Included

- Your 3-year Nitrogen Use Evaluation (one for each crop)
- Your 2019 Crop Year Nitrogen Use Evaluation (one for each crop)
- Your NMP/INMP Summary Report data by parcel (2017-2019)
- How to interpret your Nitrogen Evaluation & the Importance of Crop Coefficients
- Future Actions Required of Members with Outlier Parcels

Bell curves or distribution curves are generated using the data submitted by ESJWQC members for the past three years. Each curve is crop specific. The peak of the curve represents the amount of nitrogen applied (A) compared to the amount of nitrogen removed (R) for the most parcels in the Coalition region. The 3-Year A/R curves also show

each crop's outlier threshold if it can be calculated. Any fields with 3-Year A/R values above that threshold are considered outliers. The bell curves for each of the priority crops for the 2020 analysis are shown in the figures below. It is important to note that the Outlier Threshold is calculated every year based on the most recently reported data; therefore, this threshold will vary slightly from year to year.





#### **GROWERS NOTIFIED AS OUTLIERS**

Growers with parcels identified as outliers for any of the four priority crops (almonds, walnuts, pistachios and wine grapes) will be required to attend a crop-specific workshop and complete a survey.

#### WHAT IS AN OUTLIER?

An outlier designation is determined for each parcel by a mathematical calculation using reported nitrogen applications (A) and yield or nitrogen removed (R). Three years of A/R values from each parcel are compared to a threshold identified by the calculations done for all parcels.

**Outlier Definition:** The term outlier is used in statistics to mean a data point that is outside the normal range of all other data points in the population. Central Valley Coalitions use this term for parcels where more nitrogen is applied to the crop versus the reported yield in comparison to other parcels planted with the same crop (each Coalition only compares parcel data in their region). This is currently the best method to indicate if there may be excess nitrogen applications compared to yields.

#### **OUTLIER IS AN EARLY INDICATOR**

For a specific parcel, the outlier designation generally means significantly more nitrogen is being applied to the crop than is removed in harvest or with perennial crops, also stored in wood.

#### **REASONS FOR OUTLIER DESIGNATION**

- Reduced yields due to pest or weather damage
- Nitrogen applications greater than the crop can use
- Inefficient nitrogen and/or water applications leading to less-than-optimal yields relative to the amount of nitrogen applied

Any "excess" nitrogen could potentially leach through the soil profile to groundwater where it can contaminate drinking water supplies.

#### **OUTLIER DESIGNATION: INTERIM TOOL**

Currently the best indicator of potentially excess nitrogen being applied to a parcel is through the outlier designation.

In the future, nitrogen applications and yield will be compared to A/R acceptable ranges which are being developed.

#### **GOAL OF OUTLIER DESIGNATION**

Identify parcels where nitrogen applications exceed crop need and provide information to members on management practices to minimize excess nitrogen applications.

# WHAT WAS REPORTED TO THE WATER BOARD IN 2020?

- Field labeled with an anonymous member ID number and anonymous parcel ID
- Crop
- Acreage
- Total nitrogen applied by field
- Three years of parcel A/R ratios: 2017, 2018 and 2019 crop year.

#### MANAGEMENT PRACTICE IMPLEMENTATION REPORT (MPIR)

If you have a parcel that is identified as an outlier AND a priority crop is being grown on that parcel, you will need to complete a Management Practice Implementation Report (MPIR). The survey lists:

- Effective management practices to reduce nitrogen leaching past the root zone, and
- The current and planned practices to be implemented (if any) on parcel designated as outlier.

One year later, a follow-up survey is mailed to confirm the new practices were implemented. Annually, the Coalition tracks improvements in members' A/R ratios on the Outlier parcels. Three years after new management practices have been implemented, the Coalition will reevaluate each member's 3-year A/R ratio to determine if improvements were made.

If A/R 3-year ratios do not improve after Groundwater Focused Outreach, the Coalition may be required to submit grower contact information to the Regional Water Board for follow-up. This Focused Outreach approach is a 5-year process (see timeline on next page). Members will be responsible for attending the crop-specific workshop and completing surveys required in year 2 and 3 of the process.





# PLANNED OUTREACH FOR MEMBERS WITH OUTLIER PARCELS

In 2021, ESJWQC begins its second year of a program which consists of identifying outlier parcels and conducting outreach to members who farm those parcels. Key components of the program include:

- Organizing crop-specific workshops for members with Outlier parcels;
- Completing a Management Practice Implementation Report (MPIR);
- Promoting practices to reduce nitrogen leaching;
- Monitoring INMP member data to evaluate if improvements are being made.

#### **CROP-SPECIFIC WORKSHOPS**

At the crop-specific workshops, the Coalition staff, along with crop experts, present the most current information on nitrogen fertilizer management. This information will cover irrigation techniques plus nitrogen fertilizer types and application practices. The goal is to offer growers the most current approaches and techniques to minimize the potential for excess nitrogen being applied that could potentially leach beyond the root zone and into groundwater.

#### CROPS IN FOCUSED OUTREACH PRIORITIZATION SCHEDULE FOR 2021

In 2021, the Coalition is contacting members with outlier parcels planted with walnuts, pistachios, and grapes. For new almond parcels identified as outliers (not previously identified in 2020), members will also be contacted.

#### CHANGES FOR 2021 CROP-SPECIFIC OUTREACH

With Covid-19 restrictions on gatherings expected to continue through most of 2021, the Coalition is developing virtual online presentations to fulfill the outreach requirement of the MPIR. Sessions dates and times will be sent to members in coming months.





# **Groundwater Quality Trend Monitoring**

All Central Valley coalitions are required to track changes in aquifer water quality in basins encompassed by their organizations. Specifically, samples must be taken from wells that access shallow groundwater. The goal is twofold: determine current water quality conditions relevant to irrigated agriculture and evaluate the regional effects of farm practices on groundwater over time.

In the ESJWQC basin, wells selected for trend monitoring draw water from the Upper Zone of the aquifer above the Corcoran Clay layer. In high vulnerability areas, the bottom of the Upper Zone ranges from 40 to 300 feet below ground surface. In 2020, ESJWQC sampled 37 wells consisting of domestic wells belonging to members in addition to dedicated monitoring wells operated by various entities. As required by the coalition General Order, a registered hydrogeological consulting firm, Luhdorff and Scalmanini Consulting Engineers, evaluated each well for its construction parameters and location to irrigated crop land.

Additional groundwater data is gathered from 74 public supply wells. These "complementary wells" located throughout the region include municipal drinking water wells and dedicated monitoring wells accessing groundwater at various depths.

#### MAP OF 2020 GROUNDWATER QUALITY TREND MONITORING RESULTS FOR NITRATE + NITRITE AS N.



#### ESJWQC 2020 Groundwater Quality Trend Monitoring Well Network

ESJWQC Coundrate System: NAD 1983 StateRiere California III RIPS 0403 Feet Projection: property-Lambert Conformal Conic Unite: Fort US Service Layer Credition: Staded Relef: Comprishtid 2014 Exit Herdorgs - NB Dynodata, 1524000-cal, http://htma.yeg.pr/

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# Assessing Nitrate Impacts to Groundwater

**Groundwater Protection Formula, Values and Targets** 

New regulations focusing on nitrogen fertilizer use and its impact to groundwater were part of the 2016 revisions to Eastern San Joaquin Waste Discharge Requirements. Key changes include:

Additional individual reporting: All growers must submit an Irrigation and Nitrogen Management Plan Summary Report (INMP Summary Report) not just growers in high vulnerability areas.

**Member anonymity for reports:** Anonymous reporting of nitrogen applied, yield, and implemented management practices; outliers not individually identified.

**Measuring nitrate impacts:** A new metric for determining if the amount of nitrogen applied by irrigated agriculture could contaminate groundwater across a broad area.

The process to measure nitrate impacts is intended to answer the question: is groundwater quality in basins improving or getting worse?

This new **groundwater quality assessment approach** involves three elements:

- Groundwater Protection Formula
- Groundwater Protection Values
- Groundwater Protection Targets

# GROUNDWATER PROTECTION FORMULA AND VALUES

The Central Valley coalitions submitted to the Regional Water Board a single proposal for a Groundwater Protection Formula on July 1, 2020 which uses outputs from the Central Valley Soil and Water Assessment Tool (SWAT) computer model. The Groundwater Protection Formula was approved by the Regional Water Board in January 2021. The benefits of using the SWAT model include:

- 1. SWAT is already set up for the major crops grown in the Central Valley.
- 2. The model generates comprehensive nutrient cycling estimates throughout an entire crop year.
- 3. The model uses location-specific geographical information such as climate and soils.
- 4. The model incorporates township-specific nitrogen applied and yield data from INMP reports as inputs for estimating potential nitrogen leaching.

#### GROUNDWATER PROTECTION TARGETS DEFINED

As stated in the ESJWQC Order, "The purpose of Groundwater Protection Targets is to set a desired target that is intended for all growers (including growers that are Members of the Third Party and growers regulated under an individual order) within the township collectively to achieve compliance with the Receiving Water Limitations for groundwater within the time schedule for compliance specified in the General WDRs."

Within a year from generating the township-specific Groundwater Protection Values, the Groundwater Protection Targets will be:

- Reviewed and revised every 5 years, and
- Informed by the GAR, MPEP and the GW Trend Monitoring Program

# PROCESS TO CREATE GROUNDWATER PROTECTION TARGETS

The Central Valley coalitions are working together to create an approach for developing the Groundwater Protection Targets. Questions being considered are: is the Target township-specific; does it change over time? Several options are being considered but the Coalitions to date have not settled on an approach. The Groundwater Protection Targets will incorporate regional aquifer recharge, post root zone processes, existing aquifer conditions among other factors (Figure 1).



#### WORK IN PROGRESS

With the Groundwater Protection Formula approved in January 2021, the Groundwater Protection Values must be incorporated into Groundwater Quality Management Plans later in 2021. Then the Coalitions have one year to develop and submit Groundwater Protection Targets. The Central Valley Coalitions are working on the best methodology for doing this with the goal of being completed by mid to late 2022.

Once targets are developed, the Groundwater Protection Values will be compared to the Groundwater Protection Target for each township to determine if receiving water limits for nitrate in groundwater are being met.





Formula Mathematical formula used to calculate the GWP Value.



Value

Estimates leaching of conditions within a township



#### Target

Used to establish nitrogen under specific reasonable, quantifiable milestones

#### TIMELINE FOR GROUNDWATER PROTECTION FORMULA, VALUES AND TARGETS





# Scrutiny Intensifies on Pyrethroid Insecticides

#### High Pyrethroid Use Leading to Surface Water Detections and New Management Plans

Pyrethroid insecticides have become a foundational pest management tool since the phasing out of organophosphate insecticides such as chlorpyrifos (Lorsban, Lock-On among other brand names).

Unfortunately, increased agricultural use of pyrethroids has led to detections in surface water throughout the Central Valley, first in sediment sampling of waterways beginning in the early 2000s and in the past two years through a more sensitive analysis used on water samples collected in the creeks.

Water column analysis is focused on of six pyrethroids: bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin and permethrin. Twenty pyrethroid detections above the chronic additive pyrethroid Concentration Goal Unit (CGU) have occurred across the Coalition Region in

the 2019 and 2020 surface water sampling Water Years (WY). Due to the exceedances, **five new pyrethroid management plans** were initiated.

What this means to ESJWQC members and the Coalition annual budget when pyrethroids are found is additional follow-up sampling costs and additional outreach to growers in the watersheds where detections were found. For the 2021 WY (October 2020 through September 2021), there are 127 pyrethroid suite analyses scheduled as a result of the exceedances at Core and Represented sites.

Based on the waterway characteristics and adjacent crops where pyrethroids are being found, it's believed that spray drift from orchard air blast sprayers may be a significant contributor. When pyrethroids were first causing sediment toxicity in Coalition waterways in the early 2000s, many of the exceedances were believed to originate from irrigation runoff carrying sediment from treated fields. With the widespread adoption of drip and microsprinkler irrigation over the last 10-15 years, runoff in the coalition region is virtually nonexistent. This leads to the conclusion that spray drift from orchards adjacent to waterways may be the main source of the detections. And while only small amounts of drift may travel into a waterway, the new analytical technique can detect levels measured in parts per trillion.

#### ESJWQC members are encouraged to use extreme care when spraying pyrethroids near waterways and follow management practices that minimize off-site movement. Contact your coalition representative for more information about these practices.

#### ADDITIONAL TOXICITY TESTING

A second pyrethroid test triggered by the new regulation is monitoring for water column toxicity to H. azteca, an aquatic organism sensitive to pyrethroids (the same organism used in sediment toxicity tests). This additional test will be required beginning in the 2021 WY and will be performed concurrently with the pyrethroid test where the pyrethroid suite analysis is performed. The toxicity test is expected to cost approximately \$800 per test.

#### PYRETHROID ACTIVE INGREDIENTS\* REGULATED UNDER PYRETHROID CONTROL PROGRAM

Pyrethroids can have adverse effects on aquatic life even at very low concentrations. A physical characteristic of pyrethroids is they tend to adhere or stick strongly to soil

particles. The mode of transport for pyrethroids into the Coalition waterways includes both spray drift, irrigation/ storm runoff and sediment particle runoff. Once bound to sediment in waterways, pyrethroids can be found at detectable levels for up to 6 months.

| <b>BIFENTHRIN</b><br>- Aceto<br>- Bifen | <b>ESFENVALERATE</b><br>- Asana XL |
|---|------------------------------------|
| - Bifenture                             | LAMBDA-CYHALOTHRIN                 |
| - Fanfare                               | - Lambda- CY AG                    |
| - Sniper                                | - Silencer                         |
|   | - Warrior II                       |
| CYFLUTHRIN                              | - Beseige                          |
| - Tombstone                             |                                    |
| - Decathlon                             | PERMETHRIN                         |
|   | - First Choice                     |
| CYPERMETHRIN                            | - Stiletto                         |
| - Mustang                               | - Permethrin                       |
|   |                                    |

\*Commercial product names listed are not intended to be comprehensive for each active ingredient. Check with your supplier or PCA for additional commercial product names.



#### PYRETHROID APPLICATIONS IN THE COALITION REGION

The Coalition uses Pesticide Use Reports (PUR) from the Department of Pesticide Regulation (DPR) to help identify the source of water quality impairments.

Applications of the six pyrethroid active ingredients (bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin and permethrin) over the 2019 and 2020 WYs is shown in the graph below. According to the PUR data, the majority of pyrethroids are applied to **walnuts, pistachios, peaches, almonds and alfalfa** during the irrigation season (April – September). The exceedances of pyrethroids detected in the waterways at the 12 sample sites coincides with pyrethroids applied up to 6 months prior to the sample date.

Figure below. Pyrethroid applications to walnuts, pistachios, peaches, almond, alfalfa crops from the 2019 and 2020 WYs and the corresponding exceedances of the pyrethroid CGU (X-in the table below).







# Surface Water Quality Improvements Highlighted

ESJWQC Management Plan Strategy Successes

#### **MANAGEMENT PLANS**

Management plans were first established in 2009 when the Coalition initiated a strategy to address site subwatersheds with water quality impairments. When a management plan is initiated, the Coalition conducts additional outreach to members in the watershed in an effort to prevent future exceedances.

#### **OUTREACH AND EDUCATION**

Beginning in 2008, Coalition representatives met individually with members annually to document and recommend management practices to improve water quality in specific site subwatersheds with management plans. In total:

- Focused Outreach has been conducted for 12 years;
- The Coalition has worked with **458 growers**;
- Growers have implemented practices over **82,580** irrigated acres to reduce water quality exceedances.

#### MANAGEMENT PLAN COMPLETION

Management plans are considered completed by the Regional Water Board after three consecutive years with no exceedances.

As a result of Focused Outreach and grower participation to improve water quality, **61 pesticide and toxicity management plans have been completed**.



#### ESJWQC Focused Outreach

| Focused Outreach<br>Years | Total Targeted<br>Members | Irrigated<br>Acreage |
|---------------------------|---------------------------|----------------------|
| 2008-2010                 | 63                        | 11,272.52            |
| 2010-2012                 | 55                        | 10,083.85            |
| 2011-2013                 | 72                        | 10,972.61            |
| 2012-2014                 | 14                        | 4,409.65             |
| 2013-2015                 | 42                        | 9,947.49             |
| 2014-2016                 | 28                        | 9,837.66             |
| 2015-2017                 | 21                        | 1,958.14             |
| 2016-2018                 | 32                        | 7,278.76             |
| 2017-2019                 | 36                        | 2,162.53             |
| 2018-2020                 | 16                        | 444.4                |
| 2019-2021                 | 15                        | 4,655.76             |
| 2020-2022                 | 64                        | 9,557.16             |
| Total                     | 458                       | 82,580.53            |
|                           |                           |                      |



#### Pesticide and Toxicity Management Plans Approved for Completion



# Expert Panel Reviews ESJWQC Surface Water Program

An outcome of the revised ESJWQC Order in 2018 was the State Water Board directed a five-member "Expert Panel" to independently review the ESJWQC Surface Water Monitoring Program and assess its effectiveness. The basis for the review was 12 "charge questions" focused on ESJWQC program's monitoring design and implementation. Several public meetings were held where ESJWQC consultants provided detailed rationale for the program along with Regional Water Board staff who defended the Program they have previously approved. The panel also heard from the Environmental Community who pushed for major revisions and additions.

A key element that had strong influence on the panel's final recommendations was a field tour of 7 monitoring locations in Merced County held as part of the first panel meetings. That area is typical of all coalition sample sites and irrigated crop land. See the video prepared for the Expert Panel that includes aerial drone footage of the Merced County sample sites at https://www.esjcoalition. org/videonews/.

Ultimately, the panel endorsed the Program's overall monitoring design, data collection and analysis methods, adaptive nature and use of data to inform management practices. However, several additions to the program were named in the final report including a toxicity test for neonicotinoid insecticides.

The final recommendations are expected to be presented to the State Water Board in 2021. Whether any changes will be made to the ESJWQC program will be decided at that board meeting. The State Water Board is not mandated to make any of the recommendations.





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Projection: Inits: Foot ervice Layr Hydrology -

# **Coalition Monitoring Sites**

"X" indicates sampling occurred during the years specified (October 2013 – September 2020)

|      | Sito |  |            |      |      | W      | ater Yea    | ars    |      |      |
|------|------|--|------------|------|------|--------|-------------|--------|------|------|
| Zone | Type | Site Name                                  | County     |      |      | (Octob | per – Septe | ember) |      |      |
|      | туре |  |            | 2014 | 2015 | 2016   | 2017        | 2018   | 2019 | 2020 |
| 1    | С    | Dry Creek @ Church St                      | Stanislaus | Х    | Х    | х      | Х           | Х      | Х    | Х    |
|      | R    | Mootz Drain Dwnstm of Langworth Pd         | Stanislaus | х    | х    | х      | х           | х      |      | х    |
|      | С    | Westport Drain @ Vivian Rd                 | Stanislaus | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
|      | С    | Lateral 5 1/2 @ South Blaker Rd            | Stanislaus | х    | х    | х      | х           | х      | х    | х    |
|      | R    | Hatch Drain @ Tuolumne Rd                  | Stanislaus | х    | Х    | Х      | Х           | Х      | Х    | Х    |
|      | R    | Hilmar Drain @ Central Ave                 | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
|      | R    | Lateral 2 1/2 near Keyes Rd                | Stanislaus | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
| 2    | R    | Lateral 6 and 7 @ Central Ave              | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | х    |
|      | R    | Levee Drain @ Carpenter Rd                 | Stanislaus | Х    | Х    | Х      | Х           | Х      | Х    | х    |
|      | R    | Lower Stevinson @ Faith Home Rd            | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
|      | R    | Prairie Flower Drain @ Crows Landing<br>Rd | Stanislaus | х    | х    | х      | х           | х      | х    | х    |
|      | R    | Unnamed Drain @ Hogin Rd                   | Stanislaus | Х    | Х    | Х      | Х           | Х      | Х    | х    |
|      | С    | Highline Canal @ Hwy 99                    | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
| 3    | R    | Highline Canal @ Lombardy Rd               | Merced     | Х    | Х    |        |             |        |      |      |
|      | R    | Mustang Creek @ East Ave                   | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
|      | С    | Merced River @ Oakdale Rd                  | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
|      | С    | Canal Creek @ West Bellevue Rd             | Merced     | Х    | Х    | Х      | Х           | Х      |      | Х    |
|      | R    | Bear Creek @ Kibby Rd                      | Merced     | Х    |      |        |             |        | Х    | Х    |
| 4    | R    | Black Rascal Creek @ Yosemite Rd           | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | х    |
| 4    | R    | Howard Lateral @ Hwy 140                   | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | х    |
|      | R    | Livingston Drain @ Robin Ave               | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
|      | R    | McCoy Lateral @ Hwy 140                    | Merced     | Х    |      |        |             | Х      | Х    | Х    |
|      | R    | Unnamed Drain @ Hwy 140                    | Merced     | Х    | Х    | Х      | Х           |        | Х    | х    |
|      | С    | Duck Slough @ Gurr Rd                      | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
| E    | С    | Miles Creek @ Reilly Rd                    | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
| 5    | R    | Deadman Creek @ Gurr Rd                    | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
|      | R    | Deadman Creek @ Hwy 59                     | Merced     | Х    | Х    | Х      | Х           | Х      | Х    | X    |
|      | С    | Cottonwood Creek @ Rd 20                   | Madera     | Х    | Х    | Х      | Х           | Х      | Х    | Х    |
| F    | С    | Dry Creek @ Rd 18                          | Madera     | Х    | Х    | Х      | Х           | Х      | Х    | х    |
| 0    | R    | Ash Slough @ Ave 21                        | Madera     | Х    | Х    | Х      | Х           | Х      | Х    | х    |
|      | R    | Berenda Slough along Ave 18 1/2            | Madera     | х    | х    | х      | х           | х      | х    | x    |

C= Core site (when two Core sites per zone, sites rotate every two years). R= Represented site.

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| gger      | <b>October</b> |        |
|-----------|----------------|--------|
| ality Tri | from C         | 2020   |
| ter Qu    | SJWQC          | ember  |
| s of Wa   | the ES         | h Sept |
| dances    | within         | throug |
| Excee     | Limits         | 2019   |

|                                  | CONSTITUENT  | +<br>DO | Hd      | SC        | E. coll | NITRATE +<br>NITRITE | COPPER      | P YRETHROID          | АМРНІРОD      | ALGAE           | S EDIMENT<br>A MPHIPOD | DISCHARGE  |
|----------------------------------|--------------|---------|---------|-----------|---------|----------------------|-------------|----------------------|---------------|-----------------|------------------------|------------|
|                                  | W ATER       |         |         |           |         |                      |             | ţ                    | % Toxic       | % Toxic         | H                      |            |
| M ONITORING LOCATION             | QUALITY GOAL | 5 OR 7  | <6.5 OR | 700       | 235     | 10 MG/L              | hG/L        | CHRONIC<br>GOAL UNIT | COMPARED      | COMPARE         | % I OXIC<br>COMPARED   | CUBIC FEET |
|                                  | SAMPLE DATE  | MG/L    | >8.5    | µMHOS /CM | 001/NAW |                      | (VARIABLE ) | > 1                  | TO<br>CONTROL | D TO<br>CONTROL | TO CONTROL             | PER SECOND |
|                                  | 1/17/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
|                                  | 3/10/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
|                                  | 4/22/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
| Ash Slough @ Ave 21              | 7/15/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
|                                  | 8/12/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
|                                  | 9/10/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
|                                  | 4/22/2020    |         |         |           |         |                      |             |                      |               |                 |                        | NR         |
|                                  | 5/18/2020    |         |         |           |         |                      |             |                      |               |                 |                        | NR         |
|                                  | 6/10/2020    |         |         |           |         |                      |             |                      |               |                 |                        | NR         |
| bear Creek @ Kibby Kd            | 7/15/2020    |         |         |           |         |                      |             |                      |               |                 |                        | NR         |
|                                  | 8/12/2020    | 5.52    |         |           |         |                      |             |                      |               |                 |                        | NR         |
|                                  | 9/10/2020    | 6.67    |         |           |         |                      |             |                      |               |                 |                        | NR         |
|                                  | 1/17/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
|                                  | 2/11/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
|                                  | 3/10/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
| Berenda Slough along Ave 18 1/2  | 4/22/2020    |         |         |           |         |                      |             |                      |               |                 |                        | Dry        |
|                                  | 7/15/2020    | 4.89    |         |           |         |                      |             | 40                   |               |                 |                        | 4.14       |
|                                  | 8/12/2020    |         |         |           |         |                      |             |                      |               |                 |                        | 0          |
|                                  | 9/10/2020    |         |         |           |         |                      |             | 3                    |               |                 |                        | 0          |
|                                  | 4/22/2020    | 5.36    |         |           |         |                      |             |                      |               |                 |                        | 2.33       |
|                                  | 6/10/2020    |         |         |           |         |                      |             |                      |               |                 |                        | NR         |
| Black Rascal Creek @ Yosemite Rd | 7/15/2020    | 5.11    |         |           |         |                      |             |                      |               |                 |                        | 0          |
|                                  | 8/12/2020    | 5.01    |         |           |         |                      |             |                      |               |                 |                        | 4.78       |
|                                  | 9/10/2020    | 4.75    |         |           |         |                      |             |                      |               |                 |                        | NR         |
|                                  | 11/12/2019   |         |         |           |         |                      |             |                      |               |                 |                        | 0          |
| Canal Creek @ west pellevue nu   | 12/4/2019    |         | 6.35    |           | 1732.9  |                      | 3.4 (2.8)   |                      |               |                 |                        | 42.9       |





| INT DISCHARGE        | XIC CUBIC FEET         | TROL PER SECOND     | -0.12     | Dry       | NR        | 0.02      | Dry       | Dry       | Dry       | Dry       | Dry                      | 1.08      | 1.69      | 1.18      | Dry       | 1.37      | Dry       | Dry       | -1.83     | 13.72                   | 5.85      | 3.62      | 0         |          |
|----------------------|------------------------|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------|-----------|-----------|-----------|----------|
| S EDIME<br>A MPHIP   | % T0)                  | COMPA<br>TO CON     |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| A LGAE               | % TOXIC<br>COMPARE     | D TO<br>CONTROL     | 80        |           |           |           |           |           |           |           |           |           |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| A MPHIPOD            | % TOXIC<br>COMPARED    | TO<br>CONTROL       |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| P YRETHROID          | CHRONIC                | GOAL UNIT           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| COPPER               | μG/L                   | (VARIABLE )         |           |           |           |           |           |           |           |           |           | 47 (3.9)  |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| NITRATE +<br>NITRITE |                        | 10 MG/L             |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| E. COLI              | 235                    | MPN/100             |           |           |           |           |           |           |           | 2419.6    |           |           |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| sC                   | 700                    | µMHOS /СМ           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| Hd                   | <6.5 OR                | >8.5                |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                          |           |           |           |           |           |           |           |           |                         |           |           |           |          |
| +<br>OQ              | 5 OR 7                 | MG/L                | 6.82      |           |           |           |           |           |           |           |           | 4.18      |           |           |           |           |                          | 2.33      |           |           |           |           |           |           |           |                         | 5.93      | 6.36      | 5.58      |          |
| CONSTITUENT          | W ATER<br>QUALITY GOAL | SAMPLE DATE         | 1/17/2020 | 2/11/2020 | 3/10/2020 | 4/21/2020 | 5/13/2020 | 6/10/2020 | 7/15/2020 | 8/12/2020 | 9/10/2020 | 12/4/2019 | 1/17/2020 | 2/11/2020 | 3/10/2020 | 4/22/2020 | 5/13/2020                | 6/11/2020 | 7/15/2020 | 8/12/2020 | 9/10/2020 | 12/4/2019 | 1/17/2020 | 2/11/2020 | 3/10/2020 | 4/21/2020               | 5/13/2020 | 6/11/2020 | 7/15/2020 |          |
|                      |                        | M ONTORING LOCATION |           |           |           |           |           |           |           |           |           |           |           |           |           |           | LOLLONWOOD LFEEK @ KD 20 |           |           |           |           |           |           |           |           | Deadman Creek @ Gurr Rd |           |           |           | <u>.</u> |

# 2020 MEMBER ANNUAL REPORT



|                        | CONSTITUENT  | + 00   | Hd      | SC        | E. COLI | N ITRATE +<br>N ITRITE                   | COPPER      | P YRETHROID | А МРНІРОD     | ALGAE           | S EDIMENT<br>A MPHIPOD | DISCHARGE  |
|------------------------|--------------|--------|---------|-----------|---------|--|-------------|-------------|---------------|-----------------|------------------------|------------|
|                        | VA/ ATED     |        |         |           |         |  |             |             | 06 TOVIC      |                 |                        |            |
|                        | QUALITY GOAL | 5 OR 7 | <6.5 OR | 700       | 235     | 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1 | μG/L        |             |               | COMPARE         | % Toxic                | CUBIC FEET |
|                        | SAMPLE DATE  | MG/L   | >8.5    | µMHOS /CM | MPN/100 |  | (VARIABLE ) |             | TO<br>CONTROL | D TO<br>CONTROL | TO CONTROL             | Per Second |
|                        | 9/10/2020    | 5.26   |         |           |         |  |             |             |               |                 |                        | NR         |
|                        | 12/4/2019    | 6.92   |         |           |         |  |             |             |               |                 |                        | 1.19       |
|                        | 1/17/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
|                        | 2/11/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
|                        | 3/10/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
|                        | 4/22/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
| Deadman Creek @ Hwy 59 | 5/13/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
|                        | 6/11/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
|                        | 7/15/2020    | 1.87   |         |           |         |  |             |             |               |                 |                        | 0.37       |
|                        | 8/12/2020    | 4.43   |         |           |         |  |             |             |               |                 |                        | 0.38       |
|                        | 9/10/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
|                        | 11/12/2019   | 6.99   | 6.36    |           | 387.3   |  |             |             |               |                 |                        | 18.01      |
|                        | 12/4/2019    | 6.13   | 6.19    |           | >2419.6 |  |             |             |               |                 |                        | NR         |
|                        | 1/17/2020    |        |         |           | 307.6   |  |             |             |               |                 |                        | 0.99       |
|                        | 2/11/2020    |        | 6.49    |           | 1986.3  |  |             |             |               |                 |                        | 0.87       |
|                        | 3/10/2020    | 4.23   |         |           | 686.7   |  |             |             |               |                 |                        | 0          |
| Dry Creek @ Church St  | 4/21/2020    |        |         |           |         |  |             |             |               |                 |                        | 17.16      |
|                        | 5/12/2020    | 6.13   |         |           | 298.7   |  |             |             |               |                 |                        | 12.29      |
|                        | 6/10/2020    | 5.73   |         |           | 365.4   |  |             |             |               |                 |                        | 20.02      |
|                        | 7/14/2020    | 5.28   |         |           |         |  |             |             |               |                 |                        | 9.97       |
|                        | 8/11/2020    | 5.75   |         |           |         |  |             |             |               |                 |                        | 16.1       |
|                        | 9/8/2020     | 6.06   |         |           | 285.1   |  |             |             |               |                 |                        | 16.2       |
|                        | 10/8/2019    |        | 5.6     |           |         |  | 2.5 (2.3)   |             |               |                 |                        | NR         |
|                        | 11/12/2019   |        |         |           | 307.6   |  | .2 (0.81)   |             |               |                 |                        | 7.28       |
|                        | 12/4/2019    |        |         |           | 461.1   |  |             |             |               |                 |                        | -0.07      |
|                        | 1/17/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
|                        | 2/11/2020    |        |         |           |         |  |             |             |               |                 |                        | Dry        |
|                        | 3/10/2020    |        |         |           |         |  |             |             |               |                 |                        | NR         |



| Incretion         WATER<br>QUAUTY GOAL<br>SAMPLE DATE         Son 7           SAMPLE DATE         MG/L           SAMPLE DATE         47222020           472272020         5/13/2020           S/11/2020         5/13/2020           S/11/2020         5/13/2020           MB         5/13/2020         6/1           MB         5/13/2020         5/13/2020           MB         5/13/2020         6/1           S/10/2020         5/13/2020         6/1           MB         5/13/2020         6/1           MB         5/13/2020         6/1           MB         5/13/2020         6/1           MB         5/13/2020         6/8           MB         1/1/2020         5/18           MB         5/13/2020         6/1           MB         1/1/1/2020         5/18           MB         1/1/1/2020         6/1           MB         1/1/1/2020         5/18           MB         1/1/1/2020         6/1           MB         1/1/1/2020         6/1           MB         1/1/1/2020         6/1           MB         1/1/1/2020         6/1           MB         1/1/1/2020   | <6.5 or<br>>8.5 humber<br>>8.5 | 235<br>235<br>235 |             | (         |          |                     | % Toxic         |                        |            |
|--|--------------------------------|-------------------|-------------|-----------|----------|---------------------|-----------------|------------------------|------------|
| Anno.         Sample DATE         MG/L           4/22/2020         5/13/2020         5/13/2020           5/13/2020         6/11/2020         4.49           8/12/2020         8/12/2020         4.49           8/12/2020         6/11/2020         6.41           8/12/2020         6/11/2020         6.8           9/10/2020         6/11/2020         6.8           9/10/2020         6/11/2020         6.9           9/10/2020         1.1/1/2020         6.9           9/10/2020         1.1/1/2020         6.9           9/10/2020         1.0         6.9           9/10/2020         1.1/1/2020         0.43           9/10/2020         1.1/1/2020         0.7           9/10/2020         1.1/1/2020         0.13           9/10/2020         1.1/1/2020         0.13           9/10/2020         1.1/1/2020         0.13           10/9/2020         1.1/1/2020         0.13           10/9/2020         1.1/1/2020         0.13           10/9/2020         1.1/1/2020         0.13           10/9/2020         1.1/1/2020         0.13           10/9/2020         1.1/1/2020         0.10           10/9/2020 <td< td=""><td>&gt;8.5 µмноs /</td><td>MDN/100</td><td></td><td>ר<br/>רפיך</td><td></td><td>% TOXIC<br/>COMPARED</td><td>COMPARE</td><td>% Toxic</td><td>CUBIC FEET</td></td<>  | >8.5 µмноs /                   | MDN/100           |             | ר<br>רפיך |          | % TOXIC<br>COMPARED | COMPARE         | % Toxic                | CUBIC FEET |
| 4/2/2020     4/2/2020       5/13/2020     5/13/2020       6/11/2020     6/1       7/15/2020     6/1       8/12/2020     6/1       9/10/2020     6/1       9/10/2020     6/1       9/10/2020     6/1       9/10/2020     6/1       9/10/2020     6/1       9/10/2020     6/3       9/10/2020     6/3       9/10/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     0/3       9/11/2020     1/1/2/2020       9/11/2020     1/1/2/2020       9/11/2020     1/1/2/2020       9/11/2020     1/1/2/2020       9/11/2020     1/1/2/2020       9/11/2020     1/1/2/2020       9/11/2020     1/1/2/2020       9/10/2020     1/1/2/2020       9/10/2020     1/1/2/2020   |                                |                   | 10 MG/L (V/ | (RIABLE)  | DAL UNIT | TO<br>CONTROL       | D TO<br>CONTROL | COMPARED<br>TO CONTROL | PER SECOND |
| 5/13/2020         5/13/2020           6/11/2020         6/11/2020           8/12/2020         8/12/2020           8/12/2020         5/13/2020           8/12/2020         5/13/2020           8/12/2020         6/11/2020           8/12/2020         6/1           8/12/2020         6/1           8/12/2020         6/3           9/11/2020         6/3           9/11/2020         6/3           9/11/2020         6/3           9/11/2020         6/3           9/11/2020         6/3           9/11/2020         6/3           9/11/2020         6/4           9/11/2020         6/4           9/11/2020         6/4           9/11/2020         6/4           9/11/2020         6/4           10/8/2019         6/4           10/8/2019         6/4           10/9/2020         1/1/2/2020           9/11/2020         1/1/2/2020           10/9/2020         1/1/2/2020           9/11/2020         1/1/2/2020           9/11/2020         1/1/2/2020           9/11/2020         1/1/2/2020           9/11/1/2020         1/1/2/2020   |                                |                   |             |           |          |                     |                 |                        | Dry        |
| 6/11/2020     6/11/2020       7/15/2020     4.49       8/12/2020     4.49       9/10/2020     5/13/2020       6/11/2020     6.8       9/10/2020     6.8       11/1/2020     6.9       11/1/2020     0.9       11/1/2020     0.9       11/1/2020     0.9       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.11       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.13       11/1/2020     0.14       11/1/2020  |                                |                   |             |           |          |                     |                 |                        | Dry        |
| 7/15/2020     449       8/12/2020     4.49       8/12/2020     4.49       9/10/2020     5/13/2020       6/11/2020     6.8       7/15/2020     6.9       12/4/2019     6.9       12/4/2019     0.43       12/4/2019     0.74       12/4/2019     0.74       12/4/2019     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.74       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020     0.71       11/1/2020 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>NR</td>   |                                |                   |             |           |          |                     |                 |                        | NR         |
| 8/12/2020     4.49       9/10/2020     5.13       9/10/2020     5.13       5/13/2020     6.11       6/11/2020     6.8       7/15/2020     6.8       1/17/2020     6.9       1/17/2020     0.99       1/17/2020     0.43       1/17/2020     0.43       1/17/2020     0.43       1/17/2020     0.43       1/17/2020     0.43       1/17/2020     0.43       1/17/2020     0.43       1/17/2020     0.43       1/17/2020     0.43       1/1/1/2020     0.43       1/1/1/2020     0.43       1/1/1/2020     0.43       1/1/1/2020     0.43       1/1/1/2020     0.43       1/1/1/2020     0.43       1/1/1/2020     0.43       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       1/1/1/2020     0.41       <  |                                |                   |             |           | 7        |                     |                 |                        | NR         |
| wr Rd     9/10/2020     9/10/2020       rr Rd     5/13/2020     6.8       6/11/2020     6.8       8/12/2020     6.8       1/17/2020     0.99       1/17/2020     0.91       1/17/2020     0.74       1/17/2020     0.74       1/17/2020     0.74       1/17/2020     0.74       1/17/2020     0.74       1/17/2020     0.74       1/17/2020     1.88       1/1/1/2020     0.74       1/1/1/2020     0.74       1/1/1/2020     0.74       1/1/1/2020     0.74       1/1/1/2020     1.88       1/1/1/2020     0.74       1/1/1/2020     0.74       1/1/1/2020     0.74       1/1/1/2020     0.71       1/1/1/2020     1/1/1/2020       1/1/1/2020     1/1/1/2020       1/1/1/2020     2/11/2020       1/1/1/2020     2/11/2020       1/1/1/2020     3/10/2020       1/1/1/2020     3/10/2020       1/1/1/2020     3/10/2020       1/1/1/2020     3/10/2020       1/1/1/2020     3/10/2020  |                                |                   |             |           |          |                     |                 |                        | NR         |
| 5/13/2020         5/13/2020           nr Rd         6/11/2020         6.8           7/15/2020         6.8         7.15/2020         6.8           8/12/2020         0.99         7.11/2020         0.99           11/17/2020         1.11/2020         0.78         7.15/2020         0.74           11/17/2020         1.11/2020         0.74         7.14/2020         0.74           11/17/2020         1.11/20201         0.74         7.14/2020         1.11/20201         1   |                                |                   |             |           |          |                     |                 |                        | Dry        |
| Irr Rd         6/11/2020         6/8           7/15/2020         6.8           8/12/2020         6.9           12/4/2019         6.9           1/17/2020         0.99           1/17/2020         0.74           1/17/2020         0.74           1/17/2020         0.74           1/17/2020         0.74           1/17/2020         0.74           1/17/2020         0.74           1/1/1/2020         0.74           1/1/1/2020         0.74           1/1/1/2020         0.74           1/1/1/2020         0.74           1/1/1/2020         0.74           1/1/1/2020         0.74           1/1/1/2020         0.74           1/1/1/2020         1/1/1/2020           1/1/1/2020         1/1/1/2020           1/1/1/2020         3/10/2020           1/1/1/2020         3/10/2020           1/1/1/2020         3/10/2020           1/1/1/2020         3/10/2020  |                                |                   |             |           |          |                     |                 |                        | 3.81       |
| $Hrr dd \\ 7/15/2020 6.8 \\ 8/12/2020 6.8 \\ 1/17/2020 5.78 \\ 2/11/2020 5.78 \\ 3/10/2020 0.43 \\ 3/10/2020 1.88 \\ 7/14/2020 1.88 \\ 7/14/2020 1.88 \\ 7/14/2020 1.88 \\ 7/14/2020 0.43 \\ 10/8/2019 6.42 \\ 11/1/2020 6.42$   |                                |                   |             |           |          |                     |                 |                        | 0.39       |
| 8/12/2020 6.8<br>12/4/2019 6.8<br>12/4/2019 0.99<br>1/17/2020 0.93<br>2/11/2020 0.74<br>3/10/2020 0.74<br>5/12/2020 0.74<br>1/17/2020 0.73<br>1/17/2020 0.43<br>1/17/2020 0.43 |                                |                   |             |           |          |                     |                 |                        | 3.21       |
| 12/4/2019     0.99       1/17/2020     5.78       2/11/2020     5.78       3/10/2020     0.74       3/10/2020     0.74       5/12/2020     0.74       6/9/2020     1.88       7/14/2020     0.43       10/8/2019     0.43       11/12/2019     6.42       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2019       11/12/2019     1.1/12/2020       11/12/2020     3.1/0/2020       11/12/2020     3.1/0/2020       11/12/2020     3.1/0/2020   |                                |                   |             |           | 2        |                     |                 |                        | 1.05       |
| 1/1/2020     0.99       2/1/2020     5.78       2/1/2020     0.43       3/10/2020     0.74       6/9/2020     1.88       7/14/2020     5.15       8/11/2020     0.43       10/8/2019     6.42       11/1/2/2019     6.42       11/1/2/2019     6.42       11/1/2/2019     6.42       11/1/2/2019     1.11/2/2019       11/1/2/2019     6.42       11/1/2/2020     3.10/2020       11/1/2/2020     3.10/2020       11/1/2/2020     3.10/2020       11/1/2/2020     3.10/2020       11/1/2/2020     3.10/2020       11/1/2/2020     3.10/2020       11/1/2/2020     3.10/2020  |                                |                   |             |           |          |                     |                 |                        | NR         |
| 2/11/2020     5.78       3/10/2020     0.43       3/10/2020     0.74       5/12/2020     0.75       6/9/2020     1.88       7/14/2020     5.15       8/11/2020     0.43       10/8/2019     6.42       11/12/2019     6.42       11/12/2019     1/17/2020       Hwy 99     2/11/2020     2/11/2020       Hwy 99     3/10/2020     3/10/2020       Hwy 99     3/10/2020     5/12/2020   | 1399                           |                   |             |           |          |                     | 65              |                        | 0          |
| 310/2020     0.43       5/12/2020     0.74       5/12/2020     1.88       7/14/2020     5.15       8/11/2020     0.43       10/8/2019     6.42       11/12/2019     6.42       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2019       11/12/2019     1.11/2/2010       11/12/2019     1.11/2/2010       11/12/2019     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010       11/12/2010     1.11/2/2010 </td <td>1429</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>NR</td>  | 1429                           |                   |             |           |          |                     |                 |                        | NR         |
| Nummerod         5/12/2020         0.74           6/9/2020         1.88         6/9/2020         5.15           7/14/2020         5.15         8/11/2020         6.42           10/8/2019         6.42         1/1/2/2019         6.42           11/12/2019         6.42         1/1/2/2020         1/1/2/2020           Hwy 99         3/10/2020         3/10/2020         7/1/2020           4/21/2020         3/10/2020         5/12/2020         5/12/2020   | 1328                           |                   |             |           |          |                     | 69              |                        | 0          |
| 6/9/2020     1.88       7/14/2020     5.15       8/11/2020     0.43       10/8/2019     0.43       11/12/2019     6.42       11/12/2019     1.11/12/2019       11/12/2019     5.15       11/12/2019     5.12       11/12/2019     1.11/12/2019       11/12/2019     1.11/12/2019       11/12/2019     1.11/12/2019       11/12/2019     1.11/12/2019       11/12/2019     1.11/12/2019       11/12/2019     1.11/12/2019       11/12/2019     1.11/12/2019       11/12/2019     1.11/12/2019       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020       11/12/2019     1.11/2020  | 1422                           |                   |             |           |          |                     |                 |                        | 0          |
| 7/14/2020     5.15       8/11/2020     0.43       8/11/2020     0.43       10/8/2019     6.42       11/12/2019     6.42       11/12/2020     1/17/2020       11/12/2020     2/11/2020       11/12/2020     3/10/2020       11/2020     3/10/2020       11/2020     3/10/2020       11/2020     3/10/2020   | 1453                           |                   |             |           |          |                     |                 |                        | 0          |
| 8/11/2020 0.43<br>10/8/2019 6.42<br>11/12/2019 6.42<br>12/4/2019 6.42<br>1/17/2020 2/11/2020 7<br>3/10/2020 4/21/2020 7<br>5/12/2020 5   |                                |                   |             |           |          |                     |                 |                        | NR         |
| 10/8/2019     6.42       11/12/2019     6.42       12/4/2019     1/17/2020       1/17/2020     2/11/2020       1/12/2020     3/10/2020       5/12/2020     5/12/2020   | 757                            |                   |             |           |          |                     |                 |                        | 0          |
| 11/12/2019     6.42       12/4/2019     6.42       11/7/2020     1/17/2020       11/12/2020     3/10/2020       11/2020     3/10/2020       11/2020     3/10/2020       11/2020     5/12/2020  |                                |                   |             |           |          |                     | 80              |                        | 27.11      |
| 12/4/2019 1/17/2020 2/11/2020 3/10/2020 4/21/2020 3/10/2020 5/12/2000 5/12/20000000000000000000000000000000000   |                                | 1299.7            |             |           |          |                     |                 |                        | 0.3        |
| 1/17/2020 1/11/2020 2/11/2020 2/11/2020 2/11/2020 2/12/200 2/12/2000 2/2000 2/12/2000 2/12/2000 2/12/2000 2/12/2000 2/12/2000 2/12/20000   |                                | 461.1             | 14 (        | 2 (6.7    | 2        |                     |                 |                        | 23.63      |
| Hwy 99 2/11/2020 3/10/2020 4/21/2020 4/21/2020 5/12/2020 5/110/2020 5/12/2020 5/12/2020 5/12/2020 5/12/2020 5/11/2020 5/110/2020 5/10/2020 5/12/2020 5/12/2020 5/12/2020 5/11/200 5/12/2020 5/12/2000 5/12/2020 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/2000 5/12/20000000000000000000000000000000000   |                                |                   |             |           |          |                     |                 |                        | Dry        |
| 3/10/2020<br>4/21/2020<br>5/12/2020  |                                |                   |             |           |          |                     |                 |                        | Dry        |
| 4/21/2020<br>5/12/2020   |                                |                   |             |           |          |                     |                 |                        | 10.99      |
| 5/12/2020  |                                |                   |             |           |          |                     |                 |                        | 46.22      |
|  |                                | 307.6             |             |           |          |                     |                 |                        | 42.24      |
| 6/10/2020  |                                |                   |             |           |          |                     |                 |                        | 55.13      |
| 7/14/2020  |                                |                   |             |           |          |                     | 74              |                        | 52.1       |

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| CONSTITUENT                           |                | ÷       | ц | J<br>V    | E COL   | NITRATE + | COBBED      |   |                     | ALGAE              | SEDIMENT               | DISCHARGE  |
|---------------------------------------|----------------|---------|---|-----------|---------|-----------|-------------|---|---------------------|--------------------|------------------------|------------|
|                                       |                | Ē       |   | ł         | L. COL  | N ITRITE  | COLLEN      |   |                     |                    | AMPHIPOD               |            |
| W ATER<br>QUALITY GOAL 5 OR 7 <6.5 OR | 5 OR 7 <6.5 OR | <6.5 OR |   | 700       | 235     | 1/ 200 01 | hG/L        |   | % Toxic<br>Compared | % TOXIC<br>COMPARE | % Toxic                | CUBIC FEET |
| SAMPLE DATE MG/L >8.5                 | MG/L >8.5      | >8.5    |   | µMHOS /CM | MPN/100 | 10 MG/L   | (VARIABLE ) |   | TO<br>CONTROL       | D TO<br>CONTROL    | COMPARED<br>TO CONTROL | PER SECOND |
| 8/11/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | 72.74      |
| 9/8/2020                              |                |         |   |           |         |           |             | 2 |                     |                    |                        | 0          |
| 11/12/2019                            |                |         |   | 1071      |         |           |             |   |                     | 73                 |                        | NR         |
| 12/4/2019                             |                |         |   |           |         |           |             |   |                     |                    |                        | 0          |
| 4/21/2020 6.1                         | 6.1            |         |   |           |         |           |             |   |                     |                    |                        | 0          |
| 5/12/2020 1.89                        | 1.89           |         |   | 1202      |         |           |             |   |                     |                    |                        | 0          |
| 6/9/2020 2.1                          | 2.1            |         |   | 3800      |         |           |             |   |                     | 62                 |                        | 0          |
| 7/14/2020 5.52                        | 5.52           |         |   |           |         |           |             |   |                     |                    |                        | 0          |
| 9/8/2020 6.12                         | 6.12           |         |   | 967       |         |           |             |   |                     |                    |                        | 0          |
| 1/17/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | Dry        |
| 2/11/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | Dry        |
| 4/21/2020                             |                |         |   |           |         |           | 2.8 (2.6)   |   |                     |                    |                        | 0.42       |
| 6/10/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | 5.82       |
| 7/15/2020 6.85                        | 6.85           |         |   |           |         |           |             | 4 |                     |                    |                        | 22.14      |
| 9/11/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | NR         |
| 10/8/2019                             |                |         |   |           |         |           |             |   |                     |                    |                        | 14.09      |
| 11/12/2019                            |                |         |   |           |         |           |             |   |                     |                    |                        | Dry        |
| 12/4/2019                             |                |         |   |           |         |           |             |   |                     |                    |                        | 0.38       |
| 1/17/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | Dry        |
| 2/11/2020                             |                |         |   | 1320      |         |           |             |   |                     |                    |                        | 0          |
| 3/10/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | 0          |
| 4/21/2020                             |                |         |   |           |         | 13        |             |   |                     | 55                 |                        | 7.43       |
| 5/12/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | NR         |
| 7/14/2020                             |                |         |   |           |         |           |             |   |                     | 67                 |                        | NR         |
| 8/11/2020                             |                |         |   |           |         |           |             |   |                     |                    |                        | NR         |
| 9/8/2020                              |                |         |   |           |         |           |             |   |                     |                    | 63                     | NR         |
| 10/8/2019                             |                | 1 1     |   |           |         |           |             |   |                     |                    |                        | Dry        |
| 11/12/2019                            |                |         |   | 873       |         | 21        |             |   |                     | 81                 |                        | 9.1        |
|                                       |                |         |   |           |         |           |             |   |                     |                    |                        |            |



|                                | CONSTITUENT            | + OQ   | Hd      | sc        | E. COLI | NITRATE +<br>NITRITE | COPPER      | P YRETHROID | A MPHIPOD           | ALGAE              | S EDIMENT<br>A MPHIPOD | DISCHARGE  |
|--------------------------------|------------------------|--------|---------|-----------|---------|----------------------|-------------|-------------|---------------------|--------------------|------------------------|------------|
|                                | W ATER<br>QUALITY GOAL | 5 OR 7 | <6.5 OR | 700       | 235     | 10.101               | µG/L        | CHRONIC     | % TOXIC<br>COMPARED | % TOXIC<br>COMPARE | % Toxic                | CUBIC FEET |
| M ONLORING LOCATION            | SAMPLE DATE            | MG/L   | >8.5    | µMHOS /CM | MPN/100 | I U MG/L             | (VARIABLE ) | GOAL UNIT   | TO<br>CONTROL       | D TO<br>CONTROL    | COMPARED<br>TO CONTROL | Per Second |
|                                | 12/4/2019              |        |         | 876       | 579.4   | 32                   |             |             |                     |                    |                        | NR         |
|                                | 1/17/2020              |        |         | 738       |         | 30                   |             |             |                     |                    |                        | 0.2        |
|                                | 2/11/2020              |        |         |           |         | 32                   |             |             |                     | 28                 |                        | 4.99       |
|                                | 3/10/2020              |        |         |           |         |                      |             |             |                     | 52                 |                        | 58.86      |
|                                | 4/21/2020              |        |         |           |         |                      |             |             |                     | 81                 |                        | NR         |
|                                | 5/12/2020              |        |         |           |         | 12                   |             |             |                     | 88                 |                        | 11.79      |
|                                | 6/9/2020               |        |         |           |         |                      |             |             |                     |                    |                        | 20.8       |
|                                | 7/14/2020              |        |         |           |         | 13                   |             |             |                     | 78                 |                        | 38.38      |
|                                | 8/11/2020              |        |         |           |         |                      |             |             |                     |                    |                        | 39.56      |
|                                | 9/8/2020               |        |         | 832       |         | 19                   |             |             |                     | 68                 |                        | NR         |
|                                | 1/17/2020              |        |         | 1069      |         |                      |             |             |                     | 3                  |                        | NR         |
|                                | 2/11/2020              |        |         | 1502      |         |                      |             |             |                     | 21                 |                        | NR         |
| Lateral 6 and 7 @ Central Ave  | 4/21/2020              |        |         | 750       |         |                      |             |             |                     |                    |                        | NR         |
|                                | 7/14/2020              | 1.4    |         | 784       |         |                      |             |             |                     |                    |                        | NR         |
|                                | 8/11/2020              | 3.85   |         | 742       |         |                      |             |             |                     |                    |                        | NR         |
|                                | 1/17/2020              | 6.26   |         | 1840      |         |                      |             |             |                     | 52                 |                        | NR         |
| Levee Urain @ Carpenter Ro     | 6/9/2020               | 5.94   |         | 1801      |         |                      |             |             |                     |                    |                        | NR         |
|                                | 12/4/2019              |        |         |           |         |                      | 5.1 (2.1)   |             |                     |                    |                        | 12.12      |
|                                | 1/17/2020              |        |         |           |         |                      |             |             |                     |                    |                        | Dry        |
|                                | 2/11/2020              |        |         |           |         |                      |             |             |                     |                    |                        | Dry        |
|                                | 3/10/2020              |        |         |           |         |                      | 5.3 (2.5)   |             |                     |                    |                        | 2.29       |
| Livingston Drain @ Robin Ave   | 5/13/2020              | 6.54   |         |           |         |                      |             |             |                     |                    |                        | 0          |
|                                | 6/10/2020              |        |         |           |         |                      |             |             |                     |                    |                        | 1.4        |
|                                | 7/15/2020              | 6.41   |         |           |         |                      |             | 2           |                     |                    |                        | 7.55       |
|                                | 8/11/2020              |        |         |           |         |                      |             |             |                     |                    |                        | 8.96       |
|                                | 9/11/2020              |        |         |           |         |                      |             |             |                     |                    |                        | NR         |
| Mefant   arter   @ Liver   web | 12/4/2019              |        |         |           |         |                      |             |             |                     |                    |                        | Dry        |
| MCCOY Lateral @ Twy 140        | 1/17/2020              |        |         |           |         |                      |             |             |                     |                    |                        | Dry        |

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| 686.7<br>686.7   | 686.7<br>260.3   | 686.7<br>686.7<br>1413.6   | 686.7<br>686.7<br>1413.6  | 686.7<br>260.3<br>1413.6   | 686.7<br>686.7<br>686.7<br>1413.6   |
|--|--|--|---|--|---|
| 686.7<br>686.7   | 686.7<br>686.7<br>260.3  | 686.7<br>686.7<br>686.7<br>686.7<br>1413.6   | 686.7 686.7 686.7 686.7 686.7 686.7 1413.6 14 | 686.7<br>686.7<br>686.7<br>1413.6<br>1413.6  | 686.7<br>686.7<br>686.7<br>686.7<br>1413.6<br>1413.6  |
| 6.28<br>6.39<br>6.4  | 6.39   | 6.28<br>6.39<br>6.4  | 6.28<br>6.39<br>6.4   | 6.39<br>6.39<br>6.39   | 6.28<br>6.39<br>6.4   |
| 6.44 6.28<br>6.44 6.28<br>5.11 6.39<br>5.11 6.39<br>6.56 6.3<br>6.56 1   | 6.44 6.28<br>6.44 6.28<br>5.69 6.39<br>5.11 6.39<br>6.39<br>6.23 6.39  | 6.44 6.28<br>6.44 6.28<br>5.69 6.39<br>5.11 6.39<br>6.56 6.4<br>6.56 6.4<br>1.34 6.4<br>5.76 6.4   | 6.44 6.28<br>5.69 6.28<br>5.11 6.39<br>5.11 6.39<br>6.56 6.4<br>1.34 6.4<br>1.34 6.4<br>1.34 6.4<br>5.76 7<br>5.76 7<br>5.45 7  | 6.44 6.28<br>5.69 6.28<br>5.11 6.39<br>5.11 6.39<br>6.56 6.3<br>6.23 6.4<br>1.34 6.4<br>1.34 6.4<br>5.45 7<br>5.45 7<br>5.45 7<br>5.45 7   | 6.44 6.28<br>6.44 6.28<br>5.69 6.28<br>5.11 6.39<br>6.56 6.3<br>6.56 6.4<br>1.34 6.4<br>5.45 6.4<br>5.45 7<br>6.09 6.09   |
| 11/12/2019         6.44           6/10/2020         6.44           7/14/2020         5.69           9/11/2020         5.69           9/11/2020         5.69           10/8/2019         5.11           11/12/2019         5.11           11/12/2019         7.11           11/12/2019         7.11           11/12/2020         6.56           3/10/2020         6.56           3/10/2020         6.33           5/13/2020         6.33           6/10/2020         1.34           7/15/2020         1.34                          | 11/12/2019       6/10/2020     6.44       7/14/2020     5.69       9/11/2020     5.69       9/11/2020     5.61       10/8/2019     5.11       11/12/2019     5.11       11/12/2020     5.66       12/4/2019     7/11/2020       3/10/2020     6.56       3/10/2020     6.56       4/22/2020     6.23       5/13/2020     1.34       7/15/2020     1.34       7/15/2020     5.76       8/12/2020     5.76   | 11/12/2019       6/10/2020     6.44       7/14/2020     5.69       8/11/2020     5.69       9/11/2020     5.61       10/8/2019     5.11       11/12/2019     5.11       11/12/2019     5.11       11/1/2020     6.56       3/10/2020     6.56       3/10/2020     6.56       3/10/2020     1.34       5/13/2020     1.34       7/15/2020     1.34       7/15/2020     5.76       8/12/2020     5.75       8/12/2020     5.76       8/12/2020     5.75  | 11/12/2019         6.44           6/10/2020         6.44           7/14/2020         5.69           8/11/2020         5.69           9/11/2020         5.69           10/8/2019         5.11           11/12/2019         5.11           11/12/2019         5.11           11/12/2020         6.56           3/10/2020         6.56           3/10/2020         6.33           5/13/2020         6.34           7/15/2020         1.34           7/15/2020         1.34           7/15/2020         5.76           8/12/2020         5.76           8/12/2020         5.76           8/12/2020         5.76           9/10/2020         5.45  | 11/12/2019         6.44           6/10/2020         6.44           7/14/2020         5.69           9/11/2020         5.69           9/11/2020         5.69           10/8/2019         5.11           11/12/2020         5.69           11/12/2020         5.69           11/12/2020         5.11           11/12/2020         6.56           3/10/2020         6.56           4/22/2020         6.23           6/10/2020         1.34           7/15/2020         6.23           8/12/2020         5.76           8/12/2020         5.76           8/12/2020         5.76           8/12/2020         5.76           8/12/2020         5.76           9/10/2020         5.76           9/10/2020         5.76           8/12/2020         5.76           9/10/2020         5.45           1/17/2020         5.45   | 11/12/2019         6.44           6/10/2020         6.44           7/14/2020         5.69           8/11/2020         5.69           9/11/2020         5.69           10/8/2019         5.11           11/12/2019         5.11           11/12/2019         5.11           11/1/2020         6.56           3/10/2020         6.56           3/10/2020         6.56           3/10/2020         1.34           2/11/2020         1.34           1/1/2/2020         5.76           8/12/2020         5.76           8/12/2020         5.76           8/12/2020         5.76           9/10/2020         5.45           1/1/2/2020         5.45           9/10/2020         5.45           9/10/2020         5.45           1/17/2020         5.45           1/17/2020         5.45           1/17/2020         5.45           1/11/2/2020         5.45           1/11/2/2020         5.45           1/11/2/2020         5.45           1/11/2/2020         5.45  |
| ed River @ Oakdale Rd 7/14/2020 6.44<br>7/14/2020 5.69<br>8/11/2020 5.69<br>9/11/2020 5.11<br>11/12/2019 7<br>11/12/2019 7<br>11/12/2020 6.56<br>2/11/2020 6.56<br>3/10/2020 6.56<br>5/13/2020 6.33<br>5/13/2020 6.33<br>5/13/2020 1.34  | ed River @ Oakdale Rd<br>7/14/2020 6.44<br>8/11/2020 5.69<br>9/11/2020 5.10<br>11/12/2019 7<br>11/12/2019 7<br>11/12/2019 7<br>11/12/2020 6.56<br>2/11/2020 6.56<br>3/10/2020 1.34<br>Creek @ Reilly Rd<br>7/15/2020 1.34<br>5/13/2020 5.76<br>8/12/2020 5.76<br>2/11/2020 1.34<br>2/11/2020 1.34<br>2/11/2020 2.37<br>2/11/2020 2.37<br>2/12/2020 2.37<br>2 | ed River @ Oakdale Rd  | ed River @ Oakdale Rd 7/14/2020 6.44<br>7/14/2020 5.69<br>8/11/2020 5.69<br>9/11/2020 5.11<br>11/12/2019 7<br>11/12/2019 7<br>11/12/2020 6.56<br>2/11/2020 6.56<br>3/10/2020 1.34<br>5/13/2020 6.57<br>8/10/2020 1.34<br>7/15/2020 5.76<br>8/10/2020 5.76<br>8/12/2020 5.76<br>8/12/2020 5.76<br>8/12/2020 5.76<br>8/12/2020 5.76   | ed River @ Oakdale Rd 7/14/2020 6/4 7/14/2020 5/69 8/11/2020 5/69 9/11/2020 5/1 11/12/2019 7 11/12/2019 7 11/12/2020 6/2 Creek @ Reilly Rd 7/11/2020 6/2 7/11/2020 1/3 7/11/2020 6/3 6/10/2020 5/6 8/12/2020 6/3 1/11/2020 6/3 1/1 | ed River @ Oakdale Rd         6/10/2020         6.44           7/14/2020         5.69           8/11/2020         5.69           9/11/2020         5.11           10/8/2019         5.11           11/12/2019         1           11/12/2019         5.11           11/12/2019         1           11/12/2020         6.56           2/11/2020         6.55           2/11/2020         6.56           2/11/2020         6.56           2/11/2020         6.56           2/11/2020         6.56           2/11/2020         6.56           2/11/2020         6.56           2/11/2020         5.37           6/10/2020         5.45           2/11/2020         5.45           2/11/2020         5.45           2/11/2020         5.45           2/11/2020         5.45           2/11/2020         5.45           2/11/20204         5.45           2/11/20205         5.45           2/11/20204         5.45           2/11/20205         5.45           2/11/20204         5.45           2/11/20205         5.45           2/11/202   |
| r @ Oakdale Rd 7/14/2020 5.69 6.28 7/11/2020 5.69 7 7/11/2020 5.69 7 7/11/2020 7 7/11/2020 7 11/12/2019 7 11/12/2019 7 12/11/2020 12/11/2020 7 2/11/2020 6.56 7 7 2/11/2020 6.56 7 7 2/11/2020 6.39 7 7/12/2020 6.39 7 7/12/2020 7 134 6.4 7 2/15/2020 7 134 6.4 7 2/15/2020 7 134 7 7/15/2020 7 134 7 7 7/15/2020 7 134 7 7 7/15/2020 7 134 7 7 7/15/2020 7 134 7 7 7/15/2020 7 134 7 7 7/15/2020 7 134 7 7 7 7/15/2020 7 134 7 7 7/15/2020 7 134 7 7 7/15/2020 7 134 7 7 7 7/15/2020 7 134 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | r @ Oakdale Rd         7/14/2020         6.28         6.28           8/11/2020         5.69         7         7           9/11/2020         5.11         6.39         7           10/8/2019         5.11         6.39         7           11/12/2019         11/12/2019         7         7           11/12/2019         7         7         7           2/11/2020         5.56         7         7           3/10/2020         6.56         7         7           3/10/2020         6.33         7         7           8/12/2020         1.34         6.4         7           8/12/2020         5.76         7         7  | r@ Oakdale Rd         7/14/2020         6.28         6.28           8/11/2020         5.69         6.29         7           9/11/2020         5.11         6.39         7           10/8/2019         5.11         6.39         7           11/12/2019         11/12/2019         7         7           11/12/2020         11/12/2020         7         7           2/11/2020         6.56         7         7           3/10/2020         6.56         7         7           3/10/2020         6.39         7         7           3/10/2020         6.36         7         7           8/11/2020         6.36         7         7   | (*) Oakdale Rd         7/14/2020         6.28         6.28           8/11/2020         5.69         6.29         7           9/11/2020         5.11         6.39         7           1/1/2020         5.11         6.39         7           1/1/2020         1/1/2020         7         7           1/1/2020         1/1/2020         7         7           2/11/2020         6.56         7         7           3/10/2020         6.56         7         7           3/10/2020         6.33         6.4         7           5/13/2020         6.33         6.4         7           6/10/2020         1.34         6.4         7           7/15/2020         5.76         7         7           9/10/2020         5.45         7         7           9/10/2020         5.45         7         7   | (*) Oakdale Rd         7/14/2020         6.28         6.28           8/11/2020         5.69         6.29         7           9/11/2020         5.11         6.39         7           10/8/2019         5.11         6.39         7           11/12/2019         11/12/2019         7         7           11/12/2019         11/12/2010         7         7           2/11/2020         6.56         7         7           3/10/2020         6.56         7         7           3/10/2020         6.33         7         7           8/12/2020         6.33         6         7         7           8/12/2020         6.33         6         7         7           9/10/2020         5.76         7         7         7           9/10/2020         5.76         7         7         7           9/10/2020         5.45         7         7         7           9/10/2020         5.45         7         7         7  | r@ Oakdale Rd         7/14/2020         6.28         6.28           8/11/2020         5.69         6.29         7           9/11/2020         5.11         6.39         7           9/11/2020         5.11         6.39         7           10/8/2019         5.11         6.39         7           11/12/2019         11/12/2019         7         7           11/12/2020         6.56         7         7           2/11/2020         6.56         7         7           3/10/2020         6.56         7         7           3/10/2020         6.33         7         7           6/10/2020         1.34         6.4         7           7/15/2020         5.76         7         7           6/10/2020         5.45         7         7           7/15/2020         5.45         7         7           6/10/2020         5.45         7         7           6/10/2020         5.45         7         7           7/15/2020         5.45         7         7           6/10/2020         5.45         7         7           7/11/2020         5.45         7         7   |
| 8/11/2020     5.69        9/11/2020     5.69        9/11/2020     5.11     6.39       10/8/2019     5.11     6.39       11/12/2019     7        11/12/2019     7        11/12/2019     7        11/12/2019     7        11/12/2020     7        2/11/2020     6.56        3/10/2020     6.56        4/22/2020     6.33        5/13/2020     1.34     6.4       7/15/2020     1.34     6.4  | 8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         5.11         6.39            11/12/2019         7              11/12/2019         7         7              11/12/2019         7         7         7              eek@Reilly.Rd         1/17/2020         6.56         7 <t< td=""><td>8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         5.11         6.39            11/12/2019         7              11/12/2019         7         7              11/12/2019         7         7         7              eek@ReillyRd         1/17/2020         6.56         7   <td< td=""><td>8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         7             11/12/2019         7              11/12/2019         7               11/17/2020         7                eek@ReillyRd         2/11/2020         6.56</td><td>8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         7             11/12/2019         7              11/12/2019         7               11/12/2019         7         7               11/12/2019         7         7         7  </td></td<></td></t<> <td>8/11/2020         5.69             9/11/2020         5.11         6.39            9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         5.11         6.39            11/12/2020         6.51             11/12/2020         6.56             2/11/2020         6.56              2/11/2020         6.56               2/11/2020         6.56                eek@ReillyRd         4/21/2020         6.576  <!--</td--></td>   | 8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         5.11         6.39            11/12/2019         7              11/12/2019         7         7              11/12/2019         7         7         7              eek@ReillyRd         1/17/2020         6.56         7 <td< td=""><td>8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         7             11/12/2019         7              11/12/2019         7               11/17/2020         7                eek@ReillyRd         2/11/2020         6.56</td><td>8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         7             11/12/2019         7              11/12/2019         7               11/12/2019         7         7               11/12/2019         7         7         7  </td></td<> | 8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         7             11/12/2019         7              11/12/2019         7               11/17/2020         7                eek@ReillyRd         2/11/2020         6.56  | 8/11/2020         5.69             9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         7             11/12/2019         7              11/12/2019         7               11/12/2019         7         7               11/12/2019         7         7         7   | 8/11/2020         5.69             9/11/2020         5.11         6.39            9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         5.11         6.39            11/12/2020         6.51             11/12/2020         6.56             2/11/2020         6.56              2/11/2020         6.56               2/11/2020         6.56                eek@ReillyRd         4/21/2020         6.576 </td  |
| 9/11/2020     9/11/2020     9/1       10/8/2019     5.11     6.39       11/12/2019     9/1     9/1       12/4/2019     9/1     9/1       1/17/2020     9/1     9/1       2/11/2020     6.56     9/1       3/10/2020     6.56     9/1       3/10/2020     6.56     9/1       5/13/2020     6.33     6.4       6/10/2020     1.34     6.4  | 9/11/2020     5,11     6,39       10/8/2019     5,11     6,39       11/12/2019     5,1     6,39       11/12/2020     1/1/2020     1/1       1/17/2020     6,56     1/1       2/11/2020     6,56     1/1       2/11/2020     6,56     1/2       3/10/2020     6,56     1/2       5/13/2020     6,56     1/3       6/10/2020     1,34     6,4       7/15/2020     5,76     1/3       8/12/2020     6,72     5,76   | 9/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         7         7            11/12/2020         7         7            11/12/2020         6.56         7            2/11/2020         6.56         7            3/10/2020         6.56         7            3/10/2020         6.56         7            5/13/2020         6.56         7            6/10/2020         1.34         6.4            8/12/2020         5.76         7            8/12/2020         6.72         5.76         7   | 9/11/2020     5.11     6.39       10/8/2019     5.11     6.39       11/12/2019     5.11     6.39       12/4/2019     7.1     7       11/12/2020     6.56     7       2/11/2020     6.56     7       2/11/2020     6.56     7       3/10/2020     6.56     7       4/22/2020     6.33     6.4       5/13/2020     1.34     6.4       6/10/2020     5.76     7       8/12/2020     5.76     7       9/10/2020     5.45     7  | Grin (172)         Gin (172)         <   | 0/11/2020         5.11         6.39            10/8/2019         5.11         6.39            11/12/2019         11/12/2019         1            11/12/2020         11/12/2020         1             11/12/2020         6.56         1             2/11/2020         6.56         1             3/10/2020         6.56         1             2/11/2020         6.56         1             3/10/2020         6.56         1             2/11/2020         6.56         1             3/10/2020         6.56         1             2/11/2020         6.57         1             2/11/2020         5.76         1             2/11/2020         5.76         1             2/11/2020         5.76         1             2/11/2020         5.76         1             2/11/2020         5.45         1 </td   |
| 10/8/2019     5.11     6.39       11/12/2019     5.1     6.39       11/12/2019     7     7       12/4/2019     7     7       12/4/2019     7     7       12/4/2010     5.1     7       11/12/2020     6.56     7       2/11/2020     6.56     7       2/11/2020     6.56     7       7/12/2020     6.33     7       5/13/2020     1.34     6.4       7/15/2020     1.34     6.4  | 10/8/2019     5.11     6.39     10       11/12/2019     5.1     6.39     10       12/4/2019     10     10     10       11/12/2020     10     10     10       2/11/2020     6.56     10     10       3/10/2020     6.56     10     10       4/22/2020     6.33     10     10       6/10/2020     1.34     6.4     10       7/15/2020     5.76     10     10       8/12/2020     5.76     10     10  | 10/8/2019     5.11     6.39        11/12/2019     5.1     6.39        12/4/2019     12     1        2/11/2020     5.5     1        2/11/2020     6.56     1        2/11/2020     6.56     1        2/11/2020     6.56     1        2/11/2020     6.56     1        2/11/2020     6.56     1        2/11/2020     6.56     1        2/11/2020     6.73     1        2/11/2020     1.34     6.4        2/11/2020     5.76     1        2/11/2020     6.72     5.76   | Invision   | 10/8/2019     5.11     6.39        11/12/2019     5.1     6.39        12/4/2019     70         12/1/2020     6.5     7        2/11/2020     6.56     7        2/11/2020     6.56     7        2/11/2020     6.56     7        2/11/2020     6.56     7        2/11/2020     6.3     7        2/11/2020     6.3     7        2/11/2020     6.3     7        2/11/2020     6.3     6.4        2/11/2020     5.76     7        2/11/2020     5.76     7        2/11/2020     5.76     7        2/11/2020     5.76     7        2/15/2020     5.76     7        2/15/2020     5.45     7        2/17/2020     5.45     7   | Invariant         Invariant <t< td=""></t<> |
| 11/12/2019     1       12/4/2019     1       12/4/2019     1       1/17/2020     1       2/11/2020     6.56       3/10/2020     6.56       4/22/2020     6.3       5/13/2020     6.3       6/10/2020     1.34       6/10/2020     1.34       6/10/2020     5.76  | 11/12/2019     1       12/4/2019     1       12/4/2019     1       1/17/2020     1       2/11/2020     6.56       2/11/2020     6.56       3/10/2020     6.56       3/10/2020     6.23       6/10/2020     1.34       6/10/2020     1.34       6/10/2020     1.34       6/10/2020     5.76       8/12/2020     6.72  | 11/12/2019     1     1       12/4/2019     1     1       12/4/2010     1     1       1/17/2020     6.56     1       2/11/2020     6.56     1       3/10/2020     6.56     1       4/22/2020     6.33     6.4       5/13/2020     1.34     6.4       7/15/2020     1.34     6.4       7/15/2020     5.76     1       8/12/2020     6.72     1       9/10/2020     5.45     1  | 11/12/2019     1       12/4/2019     1       12/4/2019     1       1/17/2020     1       2/11/2020     6.56       2/11/2020     6.56       3/10/2020     6.23       4/22/2020     6.23       5/13/2020     6.23       6/10/2020     1.34       6/10/2020     5.76       8/12/2020     5.76       9/10/2020     5.45       9/10/2020     5.45       1/17/2020     5.45   | 11/12/2019     1       12/4/2019     1       12/4/2019     1       1/17/2020     1       2/11/2020     6.56       2/11/2020     6.56       3/10/2020     6.56       3/10/2020     6.23       6/10/2020     1.34       6/10/2020     1.34       6/10/2020     1.34       6/10/2020     5.76       8/12/2020     6.72       9/10/2020     5.45       1/17/2020     5.45       1/17/2020     5.45       1/17/2020     5.45  | 11/12/2019         1         1           12/4/2019         1         1         1           12/4/2010         1         1         1         1           11/1/2020         6.56         1         1         1           2/11/2020         6.56         1         1         1           2/11/2020         6.56         1         1         1           2/11/2020         6.56         1         1         1         1           2/11/2020         6.23         6.3         1 </td  |
| 12/4/2019     1     6       1/17/2020     1     6       2/11/2020     6.56     6       3/10/2020     6.56     6       4/22/2020     6.33     6       5/13/2020     6.33     6.4       6/10/2020     1.34     6.4       7/15/2020     5.76     7  | 12/4/2019     1     6       1/17/2020     1     7     6       2/11/2020     6.56     7     6       3/10/2020     6.56     7     6       3/10/2020     6.33     6     6       5/13/2020     6.13     6     7       6/10/2020     1.34     6.4     7       7/15/2020     5.76     7     7       8/12/2020     6.72     3     2   | 12/4/2019     1     6       1/17/2020     1     7     6       2/11/2020     6.56     7     6       3/10/2020     6.56     7     6       4/22/2020     6.33     6.4     7       6/10/2020     1.34     6.4     7       8/12/2020     5.76     7     7       8/12/2020     5.75     7     2       9/10/2020     5.45     7     2   | 12/4/2019     1     6       1/17/2020     1     6       2/11/2020     6.56     7     6       3/10/2020     6.56     7     6       3/10/2020     6.33     7     6       5/13/2020     1.34     6.4     7       6/10/2020     1.34     6.4     7       7/15/2020     5.76     7     2       8/12/2020     5.76     7     2       9/10/2020     5.45     7     2       1/17/2020     5.45     7     2  | 12/4/2019     1     66       1/17/2020     1     1       2/11/2020     6.56     1       2/11/2020     6.56     1       3/10/2020     6.56     1       4/22/2020     6.33     6.4       5/13/2020     1.34     6.4       6/10/2020     1.34     6.4       7/15/2020     5.76     1       8/12/2020     5.76     1       9/10/2020     5.76     1       1/17/2020     5.45     1       1/17/2020     5.45     1       1/17/2020     5.45     1   | 12/4/2019         10         66           1/17/2020         1         1         6           2/11/2020         6.56         1         6           3/10/2020         6.56         1         6           3/10/2020         6.56         1         6           3/10/2020         6.23         1         6           5/13/2020         6.33         6         1         1           6/10/2020         1.34         6.4         1         1           7/15/2020         5.76         1         2         2           8/12/2020         5.76         1         2         1           1/17/2020         5.45         1         2         1           1/17/2020         5.45         1         2         1           1/17/2020         5.45         1         1         1           1/17/2020         5.45         1         1         1           1/17/2020         5.45         1         1         1  |
| 1/17/2020     1     1     68       2/11/2020     6.56     1     68       3/10/2020     6.56     1     68       4/22/2020     6.23     1     68       5/13/2020     6.23     1     1       6/10/2020     1.34     6.4     1   | 1/17/2020     1/17/2020     0     0     0       2/11/2020     6.56     0     68/       3/10/2020     6.56     0     68/       4/22/2020     6.23     0     0       5/13/2020     1.34     6.4     0       7/15/2020     5.76     0     0       8/12/2020     6.72     0     0  | 1/17/2020     1     1     1       2/11/2020     5.5     1     68       2/11/2020     6.56     1     68       3/10/2020     6.5     1     68       4/22/2020     5.3     1     68       5/13/2020     1.34     6.4     1       6/10/2020     1.34     6.4     1       8/12/2020     5.76     1     26       8/12/2020     5.45     1     141  | 1/17/2020     1/17/2020     6       2/11/2020     5.56     68       3/10/2020     6.56     68       4/22/2020     6.33     69       5/13/2020     6.33     6.4       6/10/2020     1.34     6.4       7/15/2020     5.76     7       8/12/2020     5.75     7       9/10/2020     5.45     7       1/17/2020     5.45     7   | 1/17/2020     1/17/2020     6       2/11/2020     6.56     7     68/       2/11/2020     6.56     7     68/       3/10/2020     6.23     7     7       5/13/2020     6.23     6.4     7     7       6/10/2020     1.34     6.4     7     26/       7/15/2020     5.76     7     26/       8/12/2020     5.76     7     26/       9/10/2020     5.45     7     26/       1/17/2020     5.45     7     26/       1/17/2020     5.45     7     7  | 1/17/2020         1/17/2020         6         68           2/11/2020         6.56         7         68           3/10/2020         6.56         7         68           4/22/2020         6.35         7         68           5/13/2020         6.33         7         68           68         7/12/2020         6.33         7         7           7/11/2020         6.33         6.4         7         7           610/2020         1.34         6.4         7         7           7/15/2020         5.76         7         7         7           9/10/2020         5.45         7         7         141           1/17/2020         5.45         7         7         141           1/17/2020         5.45         7         7         7         7           9/10/2020         5.45         7         7         7         7         7           1/1/2/2020         5.45         7         7         7         7         7  |
| 2/11/2020     2/11/2020     6.56     6.66       3/10/2020     6.56     7     686       4/22/2020     6.23     7     686       5/13/2020     6.23     7     7       7/15/2020     5.76     7     7  | 2/11/2020     2/1     6.56     6.66       3/10/2020     6.56     6.9     686.       4/22/2020     6.23     6.2     686.       5/13/2020     6.23     6.4     7       6/10/2020     1.34     6.4     7       7/15/2020     5.76     7     6       8/12/2020     6.72     7     6  | 2/11/2020     2/1     2/11/2020     6.56     0     686.       3/10/2020     6.56     0     086.       4/22/2020     6.23     0     0       5/13/2020     1.34     6.4     0       7/15/2020     5.76     0     0       8/12/2020     6.72     0     260.       9/10/2020     5.45     0     260.   | 2/11/2020     2/11/2020     6.56     0     686.       3/10/2020     6.56     0     686.       4/22/2020     6.23     0     686.       5/13/2020     1.34     6.4     0       7/15/2020     5.76     0     260.       8/12/2020     6.72     0     260.       9/10/2020     5.45     0     260.       1/17/2020     1.34     0     1413.   | 2/11/2020 6.56 9 686.<br>3/10/2020 6.56 9 686.<br>4/22/2020 6.23 6.2 68<br>5/13/2020 1.34 6.4 7 1<br>6/10/2020 1.34 6.4 7 1<br>7/15/2020 5.76 7 20 1<br>8/12/2020 6.72 9 10 1413<br>9/10/2020 5.45 10 1413<br>1/17/2020 7.45 10 1413   | 2/1/2020         2/1/2020         6.56         7         686.           3/10/2020         6.56         7         686.         686.           3/10/2020         6.57         7         7         686.           5/13/2020         6.23         6.4         7         7           6/10/2020         1.34         6.4         7         7           7/15/2020         5.76         7         7         1413           8/12/2020         5.45         7         1413         1413           010/2020         5.45         7         7         1413           011/7/2020         5.45         7         7         1413           011/7/2020         5.45         7         7         1413           011/7/2020         5.45         7         7         1         1413           011/7/2020         5.45         7         7         7         7         7           011/1/2020         5.45         7         7         7         7         7         7   |
| 3/10/2020     6.56     686.       4/22/2020     6.56     686.       5/13/2020     6.33     69       6/10/2020     1.34     6.4       7/15/2020     5.76     9  | 3/10/2020     6.56     686.       4/22/2020     6.7     686.       5/13/2020     6.33     6.4     7       5/13/2020     1.34     6.4     7       7/15/2020     5.76     7     60.       8/12/2020     6.72     7     260.  | s Creek @ Reilly Rd     3/10/2020     6.56     686.       4/22/2020     6.3     0     686.       5/13/2020     6.3     6.4     7       6/10/2020     1.34     6.4     7       7/15/2020     5.76     0     260.       8/12/2020     6.72     0     260.       9/10/2020     5.45     0     260.  | s Creek@ Reilly Rd     3/10/2020     6.56     6.66     686.       4/22/2020     6.33     0     0       5/13/2020     6.34     6.4     0     1       7/15/2020     5.76     0     0     1413.       9/10/2020     5.45     0     1413.   | s Creek@ Reilly Rd     3/10/2020     6.56     6.66     686.       4/22/2020     6.23     7     687.       5/13/2020     6.34     6.4     7       7/15/2020     5.76     7     260.       8/12/2020     6.72     7     260.       9/10/2020     5.45     7     1413.       1/17/2020     5.45     7     1413.       1/17/2020     5.45     7     1413.  | s Creek @ Reilly Rd     3/10/2020     6.56     6.66     686.       4/22/2020     6.23     0     0     0       5/13/2020     6.34     6.4     0     134       6/10/2020     1.34     6.4     260.       7/15/2020     5.76     0     260.       8/12/2020     5.45     0     1413.       9/10/2020     5.45     0     1413.       11/1/2020     5.45     0     1413.       atz Drain downstream of Langworth Pond     5/13/2020     6.09     0   |
| Creek @ relity rd<br>5/13/2020 6.23 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [  | Creek @ relity rd     4/22/2020     5.3     1       5/13/2020     6.33     6.4     1       6/10/2020     1.34     6.4     1       7/15/2020     5.76     1     260.3   | Creek @ relity rd     4/22/2020     6.23         5/13/2020     6.23          6/10/2020     1.34     6.4      260.3       8/12/2020     5.76       260.3       9/10/2020     5.45       260.3   | Creek @ relity rd     4/22/2020     6.23         5/13/2020     6.23          6/10/2020     1.34     6.4         7/15/2020     5.76       260.3       8/12/2020     6.75          9/10/2020     5.45       1413.4  | Creek@ relity rd         4/22/2020         5/3         1         1           5/13/2020         6.33         6.4         1         1           6/10/2020         1.34         6.4         1         260.3           7/15/2020         5.76         1         260.3         260.3           8/12/2020         6.72         1         260.3         1413.4           1/17/2020         5.45         1         1         260.3           1/17/2020         5.45         1         1         260.3  | Creek @ reliny rd     4/22/2020     6.23     0     0       5/13/2020     6.23     0     0     0       6/10/2020     1.34     6.4     0     260.3       7/15/2020     5.76     0     260.3       8/12/2020     5.45     0     1413.4       9/10/2020     5.45     0     1413.4       2 Drain downstream of Langworth Pond     5/13/2020     6.09     0   |
| 5/13/2020     6.23     6.23       6/10/2020     1.34     6.4       7/15/2020     5.76     5.76   | 5/13/2020     6.23     6.23       6/10/2020     1.34     6.4       7/15/2020     5.76     7       8/12/2020     6.72     260.3   | 5/13/2020     6.23         6/10/2020     1.34     6.4        7/15/2020     5.76         8/12/2020     6.72      260.3       9/10/2020     5.45   | 5/13/2020     6.23     6.23        6/10/2020     1.34     6.4        7/15/2020     5.76      260.3       8/12/2020     6.72      260.3       9/10/2020     5.45      1413.6       1/17/2020     5.45      1413.6  | 5/13/2020     6.23     (1)       6/10/2020     1.34     (6.4       7/15/2020     5.76     (1)       8/12/2020     6.72     (1)       9/10/2020     5.45     (1)       1/17/2020     5.45     (1)       4/21/2020     1     (1)   | 2/13/2020         6.33  |
| 6/10/2020         1.34         6.4           7/15/2020         5.76  | 6/10/2020         1.34         6.4            7/15/2020         5.76              8/12/2020         6.72           260.3   | 6/10/2020     1:34     6.4        7/15/2020     5.76         8/12/2020     6.72         9/10/2020     5.45   | 6/10/2020         1.34         6.4            7/15/2020         5.76           260.3           8/12/2020         6.72           260.3           9/10/2020         5.45           260.3           1/17/2020         5.45           1413.6  | 6/10/2020         1.34         6.4            7/15/2020         5.76         7         260.3           8/12/2020         6.72         7         260.3           9/10/2020         5.45         7         260.3           1/17/2020         5.45         7         1413.6           1/17/2020         4/21         7         7         7  | c         6/10/2020         1:34         6.4         1           7/15/2020         5.76         7         260.3           8/12/2020         6.72         7         260.3           9/10/2020         5.45         7         1413.6           1/17/2020         5.45         7         1413.6           25.10         1/17/2020         5.45         7         1413.6           25.10         1/17/2020         5.45         7         7         1413.6           25.11         1/17/2020         5.45         7         7         1413.6           25.11         1/17/2020         5.45         7         7         7         1413.6           25.11         1/17/2020         5.45         7         7         7         7         7   |
| 7/15/2020 5.76   | 7/15/2020         5.76   | 7/15/2020         5.76         5.76         5.00           8/12/2020         6.72         5.60.3         260.3           9/10/2020         5.45         1413.6   | 7/15/2020     5.76      56.3       8/12/2020     6.72      260.3       9/10/2020     5.45      1413.6       1/17/2020     5.45  | 7/15/2020     5.76     0     260.3       8/12/2020     6.72     0     260.3       9/10/2020     5.45     0     1413.6       1/17/2020     1/17/2020     1     142.5  | z Drain downstream of Langworth Pond     7/15/2020     5.76     260       8/12/2020     6.72     260.3       9/10/2020     5.45     7       1/17/2020     5.45     1413.6       4/21/2020     5.97     7       z Drain downstream of Langworth Pond     5/13/2020     6.09  |
|  | 8/12/2020 6.72 260.3   | 8/12/2020         6.72         260.3           9/10/2020         5.45         1413.6   | 8/12/2020         6.72         260.3           9/10/2020         5.45         1413.6           1/17/2020         5.45         1413.6  | 8/12/2020     6.72     26.3       9/10/2020     5.45     1413.6       1/17/2020     5.45     1413.6       4/21/2020     4/21.2020     1413.6   | B(12/2020         6.72         260.3           9/10/2020         5.45         1413.6           1/17/2020         5.45         1413.6           1/17/2020         5.45         1413.6           4/21/2020         5.45         1413.6           2031         1/17/2020         5.45         1413.6           2031         1/17/2020         5.45         1413.6           2031         1/17/2020         5.45         1413.6           2031         1/17/2020         5.09         1413.6  |
| 9/10/2020     5.45     1413.6       1/17/2020     5.45     1413.6       1/17/2020     4/21/2020     4/21/2020       4/21/2020     6.09     6/46  | 1/17/2020         1/17/2020 <t< td=""><td>4/21/2020         4/21/2020         4/21/2020         6.09         1           vtz Drain downstream of Langworth Pond         5/13/2020         6.09         5.46         1</td><td>Stz Drain downstream of Langworth Pond         5/13/2020         6.09         6.46         6.46</td><td>6/10/2020 3.3 6.46</td><td></td></t<>  | 4/21/2020         4/21/2020         4/21/2020         6.09         1           vtz Drain downstream of Langworth Pond         5/13/2020         6.09         5.46         1  | Stz Drain downstream of Langworth Pond         5/13/2020         6.09         6.46         6.46   | 6/10/2020 3.3 6.46   |   |



|  |                                       | 3                  | -               | ,                | ;              | N ITRITE             | i,                  |                             |                           |                                       | AMPHINU                           |                          |
|--|---------------------------------------|--------------------|-----------------|------------------|----------------|----------------------|---------------------|-----------------------------|---------------------------|---------------------------------------|-----------------------------------|--------------------------|
| MONTORING LOCATION   | W ATER<br>UUALITY GOAL<br>SAMPLE DATE | 5 OR 7<br>MG/L     | <6.5 OR<br>>8.5 | 700<br>µMHOS /CM | 235<br>MPN/100 | 10 MG/L              | μG/L<br>(VARIABLE ) | Chronic<br>Goal Unit<br>> 1 | % Toxic<br>Compared<br>To | % Toxic<br>Compare<br>D TO<br>Control | % Toxic<br>Compared<br>To Control | CUBIC FEET<br>PER SECOND |
| 1  | 8/11/2020                             | 2.23               | 6.26            |                  |                |                      |                     |                             | CONTROL                   | CONTROL                               |                                   | 9.17                     |
|  | 9/8/2020                              | 2.84               |                 |                  |                |                      |                     |                             |                           |                                       |                                   | 3.65                     |
|  | 10/8/2019                             | 4.07               |                 |                  |                |                      |                     |                             |                           |                                       |                                   | 0.1                      |
|  | 11/12/2019                            |                    |                 |                  |                |                      |                     |                             |                           |                                       |                                   | 0                        |
|  | 12/4/2019                             | 4                  |                 |                  |                |                      | 18 (11)             | 2                           | 0                         |                                       |                                   | 2.79                     |
|  | 1/17/2020                             |                    |                 |                  |                |                      |                     |                             |                           |                                       |                                   | 0                        |
|  | 2/11/2020                             |                    |                 |                  |                |                      |                     |                             |                           |                                       |                                   | Dry                      |
| Mustang Creek @ East Ave   | 3/10/2020                             | 5.07               |                 |                  |                |                      |                     |                             |                           |                                       |                                   | 0                        |
|  | 4/21/2020                             |                    |                 |                  |                |                      |                     |                             |                           |                                       |                                   | Dry                      |
|  | 5/12/2020                             |                    |                 |                  |                |                      |                     |                             |                           |                                       |                                   | Dry                      |
|  | 6/9/2020                              | 4.08               |                 |                  |                |                      |                     |                             |                           |                                       |                                   | 0                        |
|  | 7/14/2020                             | 0.26               | 6.39            |                  |                |                      |                     |                             |                           |                                       |                                   | 0                        |
| L  | 9/8/2020                              |                    |                 |                  |                |                      |                     |                             |                           |                                       |                                   | Dry                      |
|  | 12/4/2019                             | 5.1                |                 | 1882             |                |                      |                     |                             |                           |                                       |                                   | NR                       |
|  | 1/17/2020                             |                    |                 | 2747             |                |                      |                     |                             |                           |                                       |                                   | NR                       |
|  | 2/11/2020                             |                    |                 | 2245             |                |                      |                     |                             |                           |                                       |                                   | NR                       |
| Prairie Flower Drain @ Crows Landing Rd  | 5/12/2020                             | 1.57               |                 |                  |                |                      |                     |                             |                           | 59                                    |                                   | 0                        |
|  | 6/9/2020                              | 6.26               |                 | 1958             |                |                      |                     |                             |                           |                                       |                                   | NR                       |
|  | 7/14/2020                             | 3.13               |                 | 1820             |                |                      |                     |                             |                           | 74                                    |                                   | 0                        |
|  | 8/11/2020                             | 1.18               |                 | 2492             |                |                      |                     |                             |                           |                                       |                                   | 0                        |
|  | 5/12/2020                             | 0.93               |                 | 1320             |                |                      |                     |                             |                           |                                       |                                   | 0                        |
| Unnamed Drain @ Hogin Rd   | 6/9/2020                              | 4.4                |                 | 914              |                |                      |                     |                             |                           |                                       |                                   | NR                       |
|  | 7/14/2020                             | 3.72               |                 |                  |                |                      |                     |                             |                           |                                       |                                   | 0                        |
|  | 2/11/2020                             |                    |                 |                  |                |                      |                     |                             |                           |                                       |                                   | Dry                      |
| Unnamed Drain @ Hwy 140  | 3/10/2020                             |                    |                 |                  |                |                      |                     |                             |                           |                                       |                                   | 7.79                     |
|  | 9/11/2020                             | 1.9                |                 |                  |                |                      |                     |                             |                           |                                       |                                   | NR                       |
| Workhook Desin © Wision Dd   | 1/17/2020                             | 5.17               |                 |                  |                |                      |                     |                             |                           | 64                                    |                                   | NR                       |
|  | 2/11/2020                             | 5.38               |                 | 166              |                |                      |                     |                             |                           |                                       |                                   | NR                       |
| Ŭ  | CONSTITUENT                           | +<br>DO            | Hd              | SC               | E. COLI        | NITRATE +<br>NITRITE | COPPER              | P YRETHROID                 | A MPHIPOD                 | ALGAE                                 | S EDIMENT<br>A MPHIPOD            | DISCHARGE                |
|  | WATER<br>QUALITY GOAL                 | 5 OR 7             | <6.5 OR         | 700              | 235            | 10 10 1              | μG/L                |                             | % Toxic<br>Compared       | % TOXIC<br>COMPARE                    | % Toxic                           | CUBIC FEET               |
|  | SAMPLE DATE                           | MG/L               | >8.5            | µMHOS /СМ        | MPN/100        |                      | (VARIABLE )         |                             | TO<br>CONTROL             | D TO<br>CONTROL                       | COMPARED<br>TO CONTROL            | PER SECOND               |
|  | 6/9/2020                              | 2.84               |                 | 888              |                |                      |                     |                             |                           |                                       |                                   | NR                       |
|  | 8/11/2020                             | 2.17               |                 | 820              |                |                      |                     |                             |                           |                                       |                                   | 0                        |
| Count E  | xceedances                            | 80                 | 12              | 33               | 19             | 8                    | 6                   | 1                           | -                         | 12                                    | 1                                 |                          |
| DO <sup>+</sup> - The WQTL for DO is <5 mg/L for Ash Slough @<br>Dry - No water at site; no samples collected.<br>ND No moscinement: Too door to moscine forw or | <u>ð A</u> ve 21, Bere                | enda Slou <u>e</u> | th @ Ave 2      | 1/2, Cotton      | wood Creek     | @ Rd 20, an          | d Dry Creek         | @ Rd 18.                    |                           | l                                     |                                   |                          |

# 2020 MEMBER ANNUAL REPORT



# Monitoring Constituents Definitions

**Dissolved Oxygen (DO):** DO criterion is protective of aquatic life: (min. of 7 mg/L). DO levels are affected by water temperature, photosynthesis & respiration. Added nutrients can stimulate algae production which dies and breaks down by microbial activity. The activity requires oxygen, depleting DO and resulting in an inability to support aquatic communities.

**pH:** Power of Hydrogen (pH) measures acidic or basic levels in a solution. Acceptable range = 6.5-8.5. Water temperature, photosynthesis & respiration can affect levels. Fertilizers & pesticides can affect pH of water/soil.

**Specific Conductance (SC):** A measure of salt and is measured in  $\mu$ S/cm. SC is an indirect measure of the presence of ions such as chloride, nitrate, sulfate, phosphate, sodium, magnesium, calcium and iron. The SC standard (700  $\mu$ S/cm) is protective of sensitive agricultural crops such as beans.

**Ammonia:** Total ammonia consists of the unionized (NH3) form plus the ionized (NH4 +) form also called ammonium. Ammonium can enter a water body through direct discharge from agricultural fertilizers or animal waste, discharges from wastewater treatment plants, or from the breakdown of organic matter in the stream. In soils, ammonium from fertilizers is typically converted to nitrite and then to nitrate over a short period of time. Exceedances of the ammonia standard are based on water temperature and pH which affect the level at which ammonia is toxic to aquatic life. Regardless of the water temperature or pH, all ammonia concentrations above 1.5 mg/L are exceedances of the drinking water standard.

**Nitrate + Nitrite:** Potential sources include runoff of fertilizers or organic matter from irrigated pasture, leaking septic systems, wastewater treatment plant effluent and animal waste. Nitrate and nitrite are very soluble and can enter surface or groundwater with irrigation and/or storm water. Animal waste can be converted to nitrate by nitrifying bacteria. Sources of animal waste include dairies, poultry, pasture and/or wildlife.

**E. coli:** Common bacterium in intestinal tracts and voided in fecal matter. E. coli in water is compared to the water quality standard protective of recreational activities (235

MPN/100mL). E. coli may persist in presence of oxygen for periods of time after being voided. Any feces voiding species of vertebrate can contribute E. coli to surface waters. Potential sources: leaky septic systems or sewer lines, wastewater treatment plant discharge, application of biosolids to ag land, defecation in or near waterbodies, dairies, manure or poultry operations.

**Arsenic:** Arsenic is found in sodium cacodylate which is applied by agriculture for broadleaf weed control and as a cotton defoliant. California Department of Pesticide Regulation records indicate no agricultural use of sodium cacodylate across the Coalition region between 1998 and 2010. Exceedances of the Arsenic WQTL can be attributed to legacy pesticide use.

**Copper:** Dissolved or sediment bound in water. Measurement of dissolved copper=dissolved form only measurement of total copper= both dissolved & bound. Dissolved copper is adjusted for the hardness (CaCO3) in water to determine concentrations that would be toxic to aquatic species. Total copper is also evaluated based on the criteria protective of the drinking water beneficial use.

**Molybdenum:** Products containing molybdenum are rarely if ever used in the Coalition area. Molybdenum can be a byproduct in copper and tungsten mining and is used in alloys due to its ability to withstand high temperatures, resistance to corrosion, and weldability. The westside region is naturally elevated in molybdenum and tends to be flushed into surface waters during periods of high rainfall. Drains such as Prairie Flower Drain which were constructed to drain shallow ground water and allow agriculture can develop elevated concentrations of molybdenum when the ground water is driven into the channel. In living organisms, molybdenum acts as a metal heteroatom and is present in various enzymes including aldehyde oxidase, sulfite oxidase and xanthine oxidase. Molybdenum can also be found in green beans, eggs, sunflower seeds, wheat flour, lentils and cereal grains. In animal studies chronic ingestion of 10 mg/kg of molybdenum can cause diarrhea, growth retardation, sterility, low birth weight, and gout.



**Chlorpyrifos:** An organophosphate insecticide used in alfalfa, grapes & orchards (among other crops). Trademarked names include: Govern™, Lock- On™, Lorsban™, NuPhos™, etc. Chlorpyrifos can bind to sediment or remain in water column. The 0.015 µg/L objective is protective of aquatic life.

**Malathion:** Malathion is an organophosphate insecticide applied to over 100 crops in the United States including alfalfa, rice, cotton, sorghum, wheat, and walnuts. It is also used for structural pest control (mosquito and fruit fly eradication, and home settings). Malathion is easily mixed with water and can be found in both urban and agricultural runoff. Malathion is a prohibited discharge pesticide except under the Rice Coalition Management Plan and any detection of the constituent is considered an exceedance. Malathion is known to be toxic to C. dubia (LC50 =  $3.35 \mu g/L$ ).

**Pyrethroids:** Are synthetic chemicals based on naturally occurring pyrethrins, found in chrysanthemums. They are an effective and widely used class of chemical for the control of pests. Pyrethroids readily bind to sediment and can also be found in the water column.

Algae toxicity: algae (aquatic plants) are sensitive to herbicides and fungicides. Algae toxicity is measured as percent growth in the sample water compared to the growth in a control treatment.

**Fathead minnow toxicity:** fathead minnows (fish) are sensitive to ammonia toxicity. At high concentrations pesticides and metals can also cause fish mortality. Fathead minnow toxicity is measured as percent survival within the sample water compared to survival in a control treatment.

Water flea toxicity: water fleas (invertebrates) are especially sensitive to water soluble pesticides such as chlorpyrifos & diazinon. Toxicity is measured as % survival in sample compared to survival in control treatment. Sediment Toxicity: One species (Hyalella azteca – amphipod) is used in sediment analysis to determine toxicity that may occur to pelagic organisms. Amphipods are sensitive to pyrethroids and other pesticides that are not highly water soluble including some herbicides, fungicides and insecticides. Amphipod toxicity is measured as percent survival within the sediment sample as compared to the survival in a control treatments.



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