

Farmers Conservation Alliance
Attention: Watershed Plan-EA
102 State Street
Hood River, OR 97031
E-mail: arnold.id.comments@gmail.com

To whom it may concern:

Please accept these comments on the Draft Watershed Plan-Environmental Assessment the Farmers Conservation Alliance has prepared for the proposed Arnold Irrigation District (“AID” or “District”) Infrastructure Modernization Project (“Draft Plan-EA”). Because the Draft Plan-EA provides that it is designed both to comply with the obligations of the Natural Resources Conservation Service (“NRCS”) under the National Environmental Policy Act (“NEPA”) and its implementing regulations (40 C.F.R. Parts 1500-08¹ and 7 C.F.R. Part 650), and also to evaluate the District’s request for funding pursuant to the Federal Watershed Protection and Flood Prevention Act, Pub. L. No. 83-566, and thereby also must comply with the requirements of the regulatory guidance for that program, Draft Plan-EA at 7-8 & n.4, these comments encompass concerns and issues related to NEPA and the analysis NRCS is required to undertake in response to AID’s request for Pub. L. No. 83-566 federal funds. These comments are submitted on behalf of Papé Ranch and those who own it and reside there, whose family members have lived in central Oregon for multiple generations and who have a long, extensive, and successful record of efforts to effectively manage and conserve the extraordinary natural resources of the region to ensure they will not only persist, but be enhanced and allowed to thrive, for the benefit of future generations who will have the good fortune to be able to call this area their home.

The overarching problem underlying the Draft Plan-EA is its overly narrow and effectively exclusive focus solely on the District’s preferences and its proposed piping project (“Proposal”) as originally developed. These flaws render the Draft Plan-EA legally invalid and inadequate across a whole range of issues, from its refusal to provide detailed consideration to various other reasonable alternatives that would better and substantially more cost-effectively serve the public interest, to a failure to look beyond the District to the Upper Deschutes Watershed (“UDW” or “Watershed”) as a whole. In short, this leads to an analysis in the Draft Plan EA-Plan that is too narrow, too shallow, too isolated, and too uncertain, which in turns leads it to analyze in detail only one action alternative (that then out of necessity becomes the “preferred” alternative) that is vastly too little, too slow, too expensive, and too rooted in the past, especially in light of the ongoing climactic changes and historic drought conditions the region is presently enduring, which the Draft Plan-EA only summarily addresses and fails to meaningfully account for. As a farmer from another district within the Watershed recently put it in testimony before the Oregon House of Representatives, they are witnessing nothing short of a “massive ecological and social disaster” without historical parallel outside the Dust Bowl era of the 1930s, which the recent multiple rounds of midseason cuts in water for North Unit’s patrons sadly readily substantiate.

¹ The Ranch notes that the Draft Plan-EA correctly notes that it is subject to the pre-2020 version of the general implementing regulations promulgated by the Council on Environmental Quality (“CEQ”), which applies to all federal agencies, and so premises its comments on that version as well. See Draft Plan-EA at 8 n.3.

Moreover, the analysis in the Draft Plan-EA effectively is written as though the District's originally submitted Proposal is occurring in a vacuum, ignoring the fact that all of the other irrigation districts in the Basin are also undertaking similar piping projects. And thus, it is not just 13.2 miles of canal that is proposed for piping, but well more than 100 miles within the Basin over the next decade that will cost hundreds of millions of dollars to complete. Other than some cursory references to these other projects, the Draft Plan-EA essentially ignores the cumulative, sum-total impacts of these other projects, which is particularly ironic given that the analyses of environmental effects in the Plan-EAs for those other projects are to a considerable degree carbon copies of the Draft Plan-EA FCA also prepared for the District's Proposal here.

Nor does the Draft Plan-EA barely reference, let alone adequately account for or seek to build on the extensive analysis that has been done to address water conservation needs in the Basin, most glaringly the work associated with the Upper Deschutes Basin Study Work Group, even though NRCS and the District are members of that group and its explicit purpose was to provide "a wealth of information to help inform future water management in the Basin." Nor does the Draft Plan-EA appear to even mention the word, "drought," even though the Basin is in the midst of perhaps the worst one it has faced in a century and, quite likely, multiple centuries. Thus, time and present circumstance simply will not allow or call for a solution premised on trying to "pipe" the Basin out of the grave water conservation crisis it faces, particularly when full build-out will take a decade or more and the funding sources required to construct it are inherently uncertain and rely principally on federal monies in a time of historically high and exploding federal debt.

These are no mere technical violations of NEPA implementing regulations, for they go to the heart of why water conservation is so critical, as well as why it must be done in the most strategic and cost-effective way possible, for the benefit not just of the District, but all residents and stakeholder groups in the Basin. The massive canal system that the irrigation districts have built up in the early portion of the 20th Century have effectively served as human-made tributaries of the Upper Deschutes for well more than 100 years now, and an entire ecosystem has grown up around, and grown to rely heavily upon, them -- not just humans, but all the flora and fauna in the region. Just because the canals were built by human toil instead of being carved out though natural means does not mean they are any less important to the species that inhabit the Basin; indeed, the same could be said of the reservoirs like Lake Billy Chinook that were created through human engineering. The importance of the canals is even more important because they criss-cross and bring a variety of hydrological benefits to an area that is arid and desert, and therefore has few natural water courses in the places where the canals run.

It would be quite another thing if AID were seeking to engage in this kind of massively expensive upgrade to its irrigation canal system solely on its own dime, but when it is seeking to make U.S. taxpayers foot the bill for around two-thirds of this project that will cost tens of millions of dollars, and will largely completely revamp the hydrology, habitat, and visual and spiritual landscape that has been in place for nearly 100 years with substantial impacts on both wildlife and landowners, then NRCS quite frankly must do a better job to ensure it fully and fairly evaluates all reasonable alternatives to improve water conservation in the watershed and not just consider the singular alternative that the District has proposed and prefers. While it may work well for AID, NRCS has an obligation to ensure it works well for the public as a whole.

Before turning to comments are organized into the following categories: (A) Structural and Foundational Flaws and Issues; (B) Analytical Inadequacies & Issues Related To Groundwater And Hydrological Effects; (C) Analytical Inadequacies & Issues Related to Interrelated Effects on Wetlands, Riparian Areas, Vegetation, & Wildlife; (D) Other NEPA Flaws and Issues in the Draft Plan-EA; (E) Process Issues and Concerns; (F) Inadequate Principles, Requirements, and Guidelines Analysis to Qualify for Funding under Public No. 83-566; and (G) Errata. In addition, the Papé Ranch would further advise that its comments are based in part on research, field work, and analysis performed by independent experts it retained to assist in its evaluation of this important proposal and its environmental effects, namely Bob Long, RG, LHG, CWRE, of CwM-H20, who contributed most specifically on groundwater and other hydrological effects and issues, and drafted Section B of these Comments; and Wendy Wenté, Ph. D., a Senior Ecologist with Mason, Bruce, & Girard, Inc., who contributed most specifically on wetlands, wildlife, and vegetation effects and issues, and drafted Section C of these Comments.

A. STRUCTURAL AND FOUNDATIONAL FLAWS & ISSUES

1. The Purpose and Need is Legally and Conceptually Flawed in Multiple Respects.

- a. The Purpose & Need Is Erroneously Written Exclusively from the District's Perspective.

The Purpose and Need in the Draft Plan-EA is written wholly from the perspective of the District, but NEPA's implementing regulations make plain that they need to reflect the federal government's purposes and needs in financing a project under PL No. 83-566. See 40 CFR 1502.13 (P&N statement "shall briefly specify the underlying purpose and need *to which the agency is responding* in proposing the alternatives including the proposed action"). Indeed, FCA openly conceded this point by defining the "Purpose and Need for the Project" as "why *the District* wants to do the Project" at the recent public meeting on the Draft Plan-EA. Pub. Mtg at 11:15-11:20 (emphasis supplied). Of itself, this is wholly inconsistent with NEPA and therefore, the Purpose and Need must be substantially reformulated for purposes of a Final EA-Plan.

- b. The Purpose & Need should acknowledge the broader interests in improving Upper Deschutes River streamflows and water conservation across the Basin.

In its reformulation in the Final EA-Plan, the Purpose & Need should be informed in large measure by the much broader federal and public interests in water conservation within the Watershed and acknowledge the direct link of the bevy of ongoing and proposed piping projects in the UDB, including AID's, to the required streamflows set forth in the Deschutes Basin HCP, which provides that "[m]ost of the irrigation district Permittees will be able to accommodate the loss of water under the DBHCP due to ongoing and planned piping of canals to reduce seepage losses." DBHCP at 1-22. To fail to acknowledge that the increased streamflows required under the DBHCP are a key, and quite likely the primary, driver of the Proposed Action along with the rest of the extremely similar piping projects in the Basin is a gross and wholly unjustified oversight that also renders the Purpose and Need foundationally flawed.

- c. The Purpose and Need does not properly account for or build off of the congressional direction in the statutes providing the authority pursuant to which NRCS is acting, Pub. L. No. 83-566 and WRDA-07.

Moreover, the Purpose and Need is also fatally flawed by not satisfactorily describing or considering the views of the Congress, expressed in NRCS's statutory authorization to fund the District's Proposed Action, most specifically Pub. L. No. 83-566, as well as in other related congressional direction. These underlying statutory aims should be expressly accounted for and inform the Purpose and Need of any federal proposed action for purposes of ensuring a sound NEPA analysis. Here, the congressional purposes are exceedingly broadly framed in relevant part to prevent "[e]rosion, floodwater, and sediment damages in the watersheds . . . of the United States," and to direct "the Federal Government [to] cooperate with States . . . and other local public agencies for the purpose of preventing such damages [and] of furthering the conservation, development, utilization, and disposal of water . . . and thereby of preserving, protecting, and improving the Nation's land and water resources and the quality of the environment." 16 U.S.C. § 1001. The statute accomplishes this policy in part by authorizing the Secretary of Agriculture to assist local organizations, in part by providing federal monies, in the preparation and implementation of plans for "works of improvement," which are in turn defined in relevant part as "any undertaking . . . the conservation, development, utilization, and disposal of water. 16 U.S.C. §§ 1002(2) & 1003(a)(4). It would be hard to imagine a more broadly scoped congressional direction in the realm of federal financing of water conservation projects.

Moreover, as the Draft Plan-EA does cursorily reference, the other relevant congressional direction enacted more recently is Section 2031 of the Water Resource Development Act of 2007 ("WRDA-07"), Pub. L. No. 110-114. Draft Plan-EA at 9. In relevant part, that statutory section states that "[i]t is the policy of the United States that all water resources projects should reflect national priorities, encourage economic development, and protect the environment by seeking to maximize sustainable economic development . . . and protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems." 42 U.S.C. § 1962-3(a)(1) & (3). The Draft Plan-EA fails to acknowledge certain other elements of congressional direction in WRDA-07, however, namely that the Congress directs the Secretary of Agriculture to adopt revised "Principles and Guidelines" to use in "the formulation, evaluation, and implementation of water resources projects," and that the revised version must expressly account for various specific considerations, including, in relevant part, "projects that use nonstructural approaches to water resources development and management; [t]he assessment and evaluation of the interaction of a project with other water resources projects and programs within a region or watershed, [and] "[t]he use of contemporary water resources paradigms, including integrated water resources management and adaptive management." 42 U.S.C. § 1962-3(2) & (3)(C), (D), & (E).

Particularly when evaluated against this essentially wide-open field of statutory authorization under which NRCS is operating, it is virtually impossible to warrant the stringent strait-jacket reflected in the Purpose and Need on which the Draft Plan-EA is premised. In addition, insofar as the applicable congressional direction does provide more specific direction, namely as reflected in the considerations that must be taken into account by the Secretary in developing the revised Principles and Guidelines, the Draft Plan-EA fails even to cite or build into the Purpose

and Need the most salient of such considerations, in particular the one calling for consideration of projects that use nonstructural approaches to water resources development and management.

- d. The Purpose and Need Wrongly Incorporates the Non-Statutory Principles, Requirements, and Guidelines into the Purpose and Need by Using Them to Determine Which Alternatives Warrant Consideration under NEPA.

In addition, the Draft Plan-EA erroneously effectively incorporates NRCS's Principles, Requirements, and Guidelines ("PR&Gs") into its Purpose and Need by using it as a basis for determining which alternatives warrant consideration in detail under NEPA. But as NRCS's own PR&G guidance states: "Under the PR&G, Federal investments are evaluated with respect to the Federal Objective and Guiding Principles. By contrast, under NEPA, the PR&G Federal Objective and Guiding Principles are *not incorporated into the purpose and need* contained in an EIS. The lead agency's purpose and need for the proposed action frames the NEPA analysis, and is not part of the PR&G analysis. The Federal Objective may overlap the purpose and need, *but the Federal Objective should be stated separately and not incorporated into the purpose and need statement in the EIS.*" PR&Gs NRCS, Guidance for Conducting Analyses Under the Principles, Requirements, and Guidelines for Water And Land Related Resources Implementation Studies and Federal Water Resource Investments (DM 9500-013) at 6 (Jan. 5, 2017) (emphases supplied). Notwithstanding this clear regulatory guidance, the Draft Plan-EA runs wholly contrary to it by relying on the PR&Gs to justify failure to consider multiple alternatives in detail for NEPA purposes in the EA. Draft Plan-EA at 45 & D-42.

- e. The Purpose and Need is also extraordinarily, unduly, and improperly narrow insofar as FCA was only able to find one action alternative to satisfy it: the District's Proposed Action.

A Purpose and Need cannot be written in unreasonably narrow terms, a rebuttable presumption of which is created on the present record solely from the fact that FCA determined that only the Proposed Action was able to satisfy it in a cost-effective manner.² Draft Plan-EA at 45-46. By right upfront unnecessarily and unreasonably constraining the water conservation to be sought by the Purpose and Need to "District-owned infrastructure," per the District's bidding, NRCS pretty much guaranteed that only two alternatives would even tentatively be able to meet it: piping and lining. This was improper and must be redressed in the Final EA-Plan, which will have the salutary effect of opening up the range of alternatives to include others that are clearly reasonable and more cost-effective, including non-structural approaches that WRDA-07 expressly indicates the Congress wants the NRCS to consider in evaluating federal water resources projects.

2. The "Proposed Action" Is Miscast Given That the Federal Decision Subject to Analysis Is Whether to Provide Nearly \$30 Million In Federal Assistance For AID's Proposal.

The Proposed Action is being funded pursuant to Pub. L. No. 83-566, which as noted above has an extremely broad scope and encompasses virtually any initiatives to improve water resource

² As described later, FCA did find that the Canal Lining Alternative met the Purpose and Need, but nevertheless improperly declined to consider it in detail "after further consideration." Draft Plan-EA at 45.

management or conservation. As a result, the decision for NRCS is whether the agency should make the requested “federal investment in a water resources project” to serve water conservation in the Basin, either pursuant to the proposal the District has put forward, or via any reasonable alternatives thereto, which is much broader than how the District has formulated its preferred outcome for which it seeks to make federal taxpayers pay the vast majority of the costs.

3. The Draft Plan-EA Fails to Consider an Adequate Range of Alternatives in detail.

The singular feature that is perhaps the most glaringly deficient in the Draft Plan-EA is its consideration of just two alternatives in detail, and what the pair of those alternatives represent: Either pipe all of AID’s main canal precisely in accordance with the proposal AID submitted to NRCS for approval, or simply do nothing at all. This is wholly and facially inadequate, under both NEPA, which requires that all reasonable alternatives be given thoughtful and detailed consideration, and the PR&Gs, which have an even broader mandate for federal agencies to meaningfully consider a range alternatives that will best serve the public’s interests, values, and needs across the watershed in which a particular restoration or conservation project is proposed.

NRCS wrongfully conflated the two separate frameworks for developing alternatives under both NEPA and WRDA-2007, the first of which turns on the Purpose and Need developed in accordance with NEPA’s implementing regulations and the latter of which needs to be handled consistent with the Principles and Requirements (“P&R”) and the PR&Gs. But the Draft Plan-EA misuses the PR&Gs for purposes of formulating and considering alternatives. As NRCS’s PR&Gs expressly state, “[t]he requirements for analyzing alternatives under the PR&G differ from the requirements for analyzing alternatives under NEPA, although both authorities ask agencies to consider a reasonable range of alternatives. The PR&G contain specific requirements for developing and analyzing alternatives, in contrast to the more general NEPA requirement that a lead agency consider a reasonable range of alternatives that may be narrower than those considered under PR&G (see 40 CFR 1502.14).” DM 9500-013 at 6. In this regard, Table 1 on p. 75 of PR&Gs also provides a comparison and differences of the key characteristics of a PR&G analysis and NEPA process.

Moreover, even though the Deschutes Basin HCP is compelling the Districts to pursue enhanced water conservation that will enable them to meet the increased streamflow targets that are due to kick in in 2028, the plan makes clear that piping is not a required component to achieve those targets. Indeed, it expressly states that “piping will not be required to fulfill the Permittees[‘] obligations under the DBHCP, and consequently piping is not part of the DBHCP.” HCP at 1-22. As a result, serious consideration needs to be given to alternatives other than piping, in particular those that are non-structural and much more cost-efficient. In this regard, and as explained in more detail below, the comprehensive Upper Deschutes River Basin Study that was a collaborative product of the Upper Deschutes River Basin Study Work Group (BSWG), of which both NRCS and AID are members, found that wholly non-structural market-based incentives were up to 12 times more cost-efficient than is piping. Upper Deschutes River Basin Study at iv. This come as no surprise to the federal government given that it has successfully employed market-based approaches in other realms with great success. G. Chan, et al., Nat. Bureau of Econ. Research, The SO2 Allowance Trading System and the Clean Air Act Amendments of 1990: Reflections on Twenty Years of Policy Innovation (Feb. 2012) (lead-in to

abstract stating that “[t]he introduction of the U.S. SO₂ allowance-trading program to address the threat of acid rain as part of the Clean Air Act Amendments of 1990 is a landmark event in the history of environmental regulation. The program was a great success by almost all measures”). Another advantage of this approach is that it can be implemented essentially immediately, and does not rely upon huge and uncertain funding sources and potential construction delays that could drag on for a decade or more. Frankly, as others have noted and the extant drought only adds an unfortunate exclamation point on, the Basin, and all of its various water-dependent stakeholders, including the District and its patrons, simply do not have a decade or more to wait to see even the relatively modest gains projected to occur in the Draft Plan-EA.

The Draft Plan-EA also utilizes a legally incorrect standard to determine whether to consider alternatives in detail. See Draft Plan-EA at 45 n.15. Moreover, NRCS’s own NEPA regulations require consideration of multiple action alternatives. 7 CFR § 650.4(e): “The interdisciplinary group considers structure and function of natural resource systems, complexity of problems, and the economic, social, and environmental effects of *alternative actions*” (emphasis supplied).

The PR&G analysis is intended to *complement and expand on or refine* the NEPA analysis to ensure that, for the purposes of the PR&G, a) environmental effects disclosed are monetized and quantified to the extent possible; and b) *alternatives considered adequately reflect the Federal Objective and Guiding Principles*. PR&G Analysis Guidance at p. 5 (emphases supplied).

The PR&G contain specific requirements for developing and analyzing alternatives, in contrast to the more general NEPA requirement that a lead agency consider a reasonable range of alternatives that may be narrower than those considered under PR&G (see 40 CFR 1502.14). Unique requirements of the PR&G include “full consideration and reporting on nonstructural alternatives or plans” (P&R, p. 11) and “an alternative plan, strategy, or action that is preferred by a local interest with oversight or implementation responsibilities” (For more information, see P&R, p. 12). The P&R also state that “[a]ddressing the complex and often conflicting water resource needs of today and the future requires the formulation of a diverse range of solutions that need to be fully considered in the decision making process.” P&R at 3.

After preliminary consideration, agencies may remove from detailed study those alternatives that do not achieve the Federal Objective and Guiding Principles. In addition, alternatives that may at first appear reasonable but clearly become unreasonable because of cost, logistics, existing technology, social, or environmental reasons may also be eliminated from further analysis. These alternatives should be briefly discussed to indicate that they were considered and the analysis should document the reason(s) why they were eliminated (e.g., they do not achieve the Federal Objective and Guiding Principles). PR&Gs at p. 18.

4. In particular, NRCS needs to consider in detail one or more non-structural alternatives, including one that relies on the much more cost-efficient use of water-marketing principles in order to satisfy its obligations under both NEPA and Pub. L. No. 83-566.

In consideration of the many competing demands for limited Federal resources, it is intended that *Federal investments in water resources as a whole should strive to maximize public benefits*, with appropriate consideration of costs. Public benefits encompass environmental, economic,

and social goals, include monetary and non-monetary effects and allow for the consideration of both quantified and unquantified measures. P&R at 3 (emphases supplied).

Moreover, Federal investments in water resources must incorporate several requirements, two of which are water use and non-structural approaches. P&R at 10-11 (Requirements E & F). And yet, the Draft Plan-EA only offers a scant and conclusory dismissal of an alternative it defines as “Following Farm Fields” in Appendix D-2. Draft Plan-EA at D-43 (described as “a non-structural alternative that includes permanently transferring or temporarily leasing water rights from irrigated lands or otherwise not using water rights appurtenant to irrigated lands”). Giving such short shrift to non-structural alternatives is in blatant violation of PR&Gs. Section 6c(2)(c).

The eminent reasonableness, and indeed, superiority of such an alternative is evident from documentation prepared for the Upper Deschutes River Basin Study Work Group (“BSWG”), of which AID and NRCS are members. In particular, the Upper Deschutes River Basin Study found that the use of “market-based incentives” could increase streamflows by virtually the same amount as piping and other massive capital infrastructure projects, but at a fraction (less than 10 percent, both in gross and per acre-foot) of the cost, and identified benefits as including that they are “tested and effective approaches,” “are flexible and can be scaled for dry years,” and “could make water available at relatively low cost.” UDRBS at iv. In this same regard, NRCS needs to consider the analysis in Technical Memorandum 7 (July 2017), prepared by Summit Conservation Strategies, for the BSWG, which is not even cited in the references for the Draft Plan-EA (even though the similar Technical Memo for LPE Task 6 is, see Draft Plan-EA at 112).

A water bank in particular also has a proven track record in the Basin through the experience and overall success of the Deschutes Water Alliance Bank. In addition, there are three Groundwater Mitigation Banks operational within the Basin, including one managed by AID itself. <https://www.oregon.gov/OWRD/programs/WaterRights/Permits/DeschutesGroundwaterMitigation/MitigationCredits/Pages/Mitigation-Banks.aspx> (last visited July 8, 2021). In addition, previous experience with a surface water bank, the Deschutes Water Alliance Bank that by all accounts was a success for the years of its operation. Finally, the editorial board of the *Bend Bulletin* just published an editorial expressly in favor of resuscitating the use of a water bank, revealing broader public interest in this form of alternative. Editorial: Revive the Water Bank to Help the Deschutes Basin (June 24, 2021), at https://www.bendbulletin.com/opinion/editorial-revive-the-water-bank-to-help-the-deschutesbasin/article_43d51908-d445-11eb-9b7b-635c55a44f28.html (last visited July 8, 2021).

In this light, as the *Bulletin* recently opined, the Final EA-Plan must consider in detail an alternative that would reconstitute a water bank in the Basin, only this time providing for all members of the Deschutes Basin Board of Control, including AID, to be members and participants in order to gain the maximal benefit from its operations.

The Draft Plan-EA provides only the scantest of references to such an alternative, stating under the alternative it labels, “Following Farm Fields,” that states it is a “non-structural alternative that includes permanently transferring or temporarily leasing water rights from irrigated lands or otherwise not using water right appurtenant to irrigated lands.” Draft Plan-EA at D-43. Moreover, the document refuses to consider any alternative along these lines largely because

“allowing would be voluntary, and any water saved would not necessarily be put instream by the patrons.” *Id.* This ignores the fact that the agreement between AID and NUID is wholly volitional as well, and thus the rejection of the nonstructural alternative on a similar ground reflects a blatant double-standard. See Draft Plan-EA at 50 (“Following the completion of the project and verification and measurement of the total water savings, AID would pass up to 10,526 acre-feet/year to NUID through the Deschutes River during the irrigation season”). *Id.* The Draft Plan-EA also wholly ignores the fact that Technical Memo 7 that was completed for the Upper Deschutes Basin Study Work Group found considerable interest in voluntary transfers among patrons through the use of surveys, and that the economic dynamics were particularly favorable to believing that they could save up to 160,000 acre-feet of water per year in the Basin.

Another potential option in this regard that warrants detailed consideration would entail the gradual evolution of the District into an updated water management institution like a water bank, opening the water management to a voluntary free market approach to obtain the highest economic or ecological value for water diverted or pumped from the ground. Ironically in this regard, the Draft Plan-EA fails to make any mention of the District’s existing Groundwater Mitigation Bank that AID has registered with the state to hold and convey any type of mitigation credits, including temporary (annual) mitigation credits based on instream leases and time-limited instream transfers. Neither the results of the AID mitigation bank operations nor any ideas about how to form and operate a more robust water bank on a larger scale were considered or even mentioned in the Draft Plan-EA. These promising alternatives need to be evaluated.

The inefficiencies extant in certain of the irrigation systems of Central Oregon suggest that new methods of valuing water and distributing water might be possible outside an irrigation district framework. These options might include innovative economic models, groundwater-only models, or hybrid models of water use. One alternative to reduce loss and return water to the Deschutes River would provide for water users currently supplied by the AID to gradually transition to increasing use of groundwater for irrigation. This would encourage implementation of on-farm water conservation methods, further reducing waste, and crop selection would have to return sufficient profit to pay for the cost of groundwater use. The cost of implementing such a change and the impacts on both the river and on the groundwater system have not been assessed.

AID’s water rights could in turn be returned to the Deschutes River as an in-stream right, which would solve a significant portion of the low-flow issues in the river. Alternatively, a portion of that water could be used for either Ag-MAR or Aquifer Storage and Recovery (ASR) through injection wells to support the new groundwater use in the area. The water right could also be held in forbearance or as mitigation to allow issuance of new groundwater rights for irrigators in the original District service area (i.e. like the current mitigation bank run by AID). It is also possible that a free-market approach to the water allocation held by the District could be developed in a water banking framework. There are many related possibilities that were not considered to any degree in the Draft Plan-EA. Use of groundwater was eliminated from consideration on the basis of cost and water right complexity, though no engineer’s cost analysis or evaluation of water rights or water permitting options was presented on either factor. In addition, the likely impacts of deepening wells to mitigate for the elimination of recharge to the groundwater system was not evaluated for cost to residents and other groundwater users, as addressed in more detail below.

One distinct advantage that commends the exploration of a water marketing alternative for the Watershed is that it can effectively be implemented immediately, and is not contingent on securing future federal funding in the tens of millions of dollars over the course of the next decade. Moreover, just a fraction of the \$28 million that AID is seeking in Pub. L. No. 83-566 funds could go a long way to incentivizing the use of the water bank, and allowing participants to plough the proceeds from the transfers made through the bank into on-the-ground irrigation efficiency improvements, which would create a “virtuous” conservation cycle that could lead to synergistic, and non-zero-sum results for all involved.

Another advantage that commends detailed consideration of a water marketing alternative is that it can be implemented without any adverse environmental effects that necessarily arise from construction of a structural alternative, the minimization of which is a requirement NRCS must satisfy in planning and carrying out Watershed Projects funded with grant money pursuant to Pub. L. No. 83-566. See 7 CFR § 622.30(a), which states that: “Watershed projects are to be planned and carried out in a way that will (1) minimize all adverse impacts, and (2) mitigate unavoidable losses to the maximum practicable degree.”

Along these same lines, a hybrid or complementary alternative should also be considered in detail in the Final Plan-EA. Where applicable, alternatives should be formulated to examine the incremental efficiency (varying the scale) of an activity and separating it into various components. Alternatives with multiple components should be considered together and as separate alternatives if the components are independent, meaning there are no obvious dependencies or a scientific need to implement all of the measures as a system. PR&Gs, sec. 6.b.(4)(c), p. 17. For example, an alternative that would avoid piping in segments where loss to wildlife habitat, vegetation, and property values would be the greatest would appear to be particularly in order. In addition, an alternative based on a Purpose and Need that takes into account the public’s and all stakeholder interests, and not just those of AID, and provide for the irrigation districts not to have to achieve all of the water conservation required of them under the DBHCP via structural improvements, is also clearly warranted. This would also be consistent with the Upper Deschutes River Basin Study, which calls for a complementary approach utilizing the best and most cost-effective mix of approaches. As explained above, boxing the Proposed Action in by stating that it could only be accomplished by structural improvements to the District’s existing system was a self-imposed constraint improperly adopted in the first place that, wittingly or not, served to make the Plenary Piping Alternative effectively a *fait accompli* and only one action alternative left standing.

5. The EA-Plan Improperly Failed to Consider in Detail the Canal Lining Alternative.

Notwithstanding its finding that the “canal lining alternative” satisfied even its overly constrained “formulation criteria,” the Draft Plan-EA eliminated it from detailed consideration because of flawed cost estimates associated with lining vis-à-vis the Plenary Piping Alternative. Draft Plan-EA at 46 & Appendix D.3 & D.4. The flaws arise from a variety of sources.

First, it is ironic in the extreme to reject the canal lining alternative based on a cost-effectiveness rationale when the Draft Plan-EA largely ignores this variable otherwise in its analysis of alternatives and, indeed, identifies as its preferred alternative the Plenary Piping Alternative that

the BSWG's own studies shows is up to ten times less cost-effective than non-structural market-based approaches that it summarily dismissed out of hand. As Technical Memorandum No. 7 states, "[i]t is clear that market-based approaches merit a significant role in any cost-effective portfolio of new water supplies." Tech Memo 7 at p. 57. Moreover, although the Draft Plan-EA cites excessive cost as the major reason for opting not to consider the canal-lining alternative in detail, even in part, per guidance in the PR&Gs, Draft Plan-EA at 45-46, it fails to acknowledge that cost and economic factors, on their own, do not justify declining to address an alternative in detail under NEPA or its implementing regulations. This is especially the case given that the Draft Plan-EA concedes that the lining alternative meets all elements of even the overly cramped Purpose and Need, and so further and more detailed exploration are clearly justified to assess its viability as opposed to the single study on which the Draft Plan-EA relies to reject its consideration in detail. Draft Plan-EA at 45-46.

Second, the Draft Plan-EA relies on improper parameters and variables in its attempt to justify declining to consider the canal lining alternative in detail. For one thing, it uses a 100-year time frame, on the basis of which it concludes the District would need to completely reline its main canal multiple times, thereby substantially increasing the cost of that alternative. As Summit Conservation Strategies noted in its Technical Memorandum No. 7, however, "[f]ifty-year terms are often used in economic analyses of reservoirs or other water infrastructure." Tech. Memo 7 at pp. 5-6 & n.7. This is in large measure because making assumptions or relying on benefits from any capital improvement beyond 50 years is inherently speculative, and yet, the Draft Plan-EA fails to acknowledge this standard practice or seek to explain its radical departure from it through using a time frame twice as long. Next, the very study it cites indicates that canal lining infrastructure typically can be expected to last 50 years: "Concrete and compacted earth canal linings have a typical service life of about 50 years." Bureau of Reclamation, Canal-Lining Demonstration Proj. Year 10 Final Rpt. no. R-02-03 at 2 & ES-1, Table ES-1 (Nov. 2002).

Third, the Draft Plan-EA appears to mischaracterize the results of the study on which it relies, which provides that, of the 34 test sections it examined, only seven had failed, "while the remaining test sections are in fair to excellent conditions." Report Documentation Page. In fact, of the eight test sections within AID, five were assessed as still being in excellent condition (Sections A-1, A-2, A-3, A-7, A-8), and the condition of one more was assessed as Good (A-4). Canal-Lining Rpt. at 92-126. Nor does the Draft Plan-EA account for the fact that the report evaluated many different kinds of lining alternatives and therefore, to treat all lining options the same is unwarranted and improper. The Draft Plan-EA further fails to account for problems that can arise from excessive over-excavation in the cleaning of canals. For example, the Bureau of Reclamation's Canal Lining Report provides that "[a] district that over-excavates their canal 1 inch each year, will completely remove a 3-ft compacted clay lining in only 36 years." Canal-Lining Rpt. at 2.

Fourth, no attempt is made to evaluate the efficacy or actual maintenance costs of other lining projects, even from within the Basin. For example, the North Unit Irrigation District has lined nearly 12 miles of its main canal, in part due to the lower costs associated with that approach, and drawing lessons from its experience, as well as from other more recent projects of potential relevance, would be instructive and is necessary before completely shelving a lining alternative from detailed consideration. Instead, the Draft Plan-EA provides insufficient substantiation to

support its extraordinarily high cost estimate for the lining alternative, in particular because it depends on a single study even though lining is a common practice throughout the Western U.S. In this light, additional and more recent data are clearly available and need to be considered.

Finally, the Draft Plan-EA fails to explain why a lining alternative was found to be reasonable for detailed consideration in the Tumalo District EA-Plan, but not for AID's. That is, NRCS reached the wholly opposite determination in opting to consider a canal-lining alternative in detail in the extremely similar EA that FCA prepared for the Tumalo Irrigation District piping project. Nowhere does NRCS seek to explain why the canal lining alternative justified consideration in detail in that EA-Plan while it ostensibly does not in this one. This discrepancy must be explained in the Final Plan-EA, but on its face would appear to simply be unwarranted.

6. The Plan-EA Also Needs to Consider in Detail Other Water Management Alternatives.

The Draft Plan-EA assumes that piping is the only water management option that can meet the proper Purpose and Need of the Proposed Action. Consequently, the Draft Plan-EA eliminated all other options from detailed consideration without presenting a fact pattern based on a technical evaluation or investigation within the District. Included in the eliminated alternatives were canal lining and on-farm efficiency improvements, both of which could significantly improve efficiency and return flows to the Deschutes River. Further and more detailed analyses of these and the other eliminated options are necessary, with a focus on district-specific and canal-specific hydrogeologic conditions.

Relying on data from outside the project area that is based on a basin-wide assessment is misleading to the public and feeds into a narrative that is self-dealing to support piping without assessing on-the-ground impacts and costs to people living near or in the project area. This narrative leap allows the authors of the Draft Plan-EA to ignore competing opportunities in water management and fails the public by falling short of the challenge of doing the work needed to assess the critical unseen water resource of the community at a project level.

Three technical scenarios were not identified or address in the AID-PIR. These include:

- Selective/targeted canal leakage improvements,
- Winter canal Managed Aquifer Recharge, and
- Aquifer Storage and Recovery.

a. Selective Canal Improvement Alternative

The issues of high seepage loss, delayed deliveries, erosional problems, and Deschutes River flows could all be improved by targeting a few high-impact reaches of the AID canal. The 2016 canal field survey (Crew, 2017) identified which reaches contribute most to seepage losses. Further investigation into the contributions of local soil and geologic conditions to seepage, canal recharge time, and erosion could result in targeted options that improve the most impactful reaches of the canal system for the lowest cost. Because of the minimal level of investigation completed by the AID, it is not known if piping only a small portion of the canal could see major improvements for most or all factors under consideration. An appropriate cost-benefit

optimization study, including the impacts of reduced seepage to groundwater wells and the local economy, should be conducted to determine if full piping is necessary or the most effective course of action.

b. Managed Aquifer Recharge Alternative

The primary goal of piping central Oregon irrigation canals is to limit diversion of surface water from the Deschutes River in the summer season. The first item listed in the Draft Plan-EA's Purpose and Need for Action is improving water conservation. Piping will meet this goal by reducing seepage losses and allowing of some conserved water to remain in the middle and lower Deschutes River course and later diverted at the North Unit Irrigation District.

During the winter season, the flow rate in the Deschutes River increases as one moves downstream from the Wickiup Reservoir to Lake Billy Chinook due to inflow contributions from High Cascade recharge and groundwater discharge through springs. Flows upstream of Benham Falls, a major groundwater discharge point about 3.5 miles upstream from the AID diversion, are often too low for healthy fish populations and habitat in the winter. This is primarily due to impoundment of winter water in the Wickiup and other reservoirs. Below Benham Falls, winter flows are generally sustainable (refer to Figure 5-2 in the AID-PIR). Limiting diversions into the AID canal in the summer irrigation season would not address the low wintertime flows in the Upper Deschutes River and could negatively impact groundwater resources below the irrigation districts by restricting local groundwater recharge through seepage.

The AID Draft Plan-EA proposes to reduce, forgo, or transfer storage in the Crane Prairie and Wickiup Reservoirs to allow for mitigation of low wintertime flows in the Upper Deschutes above Benham Falls without assessing the impacts of climate change on the availability of storage water flow and changes in winter snow melt timing over the proposed 107-year project life (Draft Plan-EA, Appendix D, at D-4). The impact of climate change on storage at Crane Prairie and Wickiup Reservoirs must be completed over an equivalent time period to assess the viability of the proposed option to pipe AID's main canal and use Crane Prairie storage water or live flow at or through Wickiup Reservoir to mitigate flows in the upper Deschutes.

Agricultural Managed Aquifer Recharge (Ag-MAR) also has the capability to address both parts of the Deschutes River flow problem.

Ag-MAR is a system in which surface water is used to recharge aquifers via infiltration during periods of water availability and is stored underground in aquifers for later use as irrigation water or other supply. The AID, as well as other central Oregon districts, could utilize existing canal infrastructure as an Ag-MAR system to manage conjunctive uses of surface water and groundwater. In this system, the current minimal winter reservoir releases from Wickiup Reservoir would be increased, raising flow rates in the Upper Deschutes River, and water would be diverted through the canals during the non-irrigation season. This water would satisfy stock watering and other non-irrigation uses but would predominantly be allowed to seep into the groundwater system, effectively storing winter water within the aquifer. Given the estimated loss rate during the irrigation season, 7,000 acre-feet or more could be stored over three winter months. The infiltrated and stored groundwater would then be available for irrigation or other uses during the summer season. A significant portion of the required irrigation water might be

supplied by infiltrated Ag-MAR water. The remaining need could then be met by limited summertime diversions through the canal, therefore also restoring significant flows to the Middle Deschutes River during the summer. MAR has already been demonstrated to increase flows in other rivers regulated for fish passage and habitat (Van Kirk et al., 2020). This is essentially a method of partial use of groundwater, which was eliminated from consideration by the AID, TID, and COID. However, there are many benefits of this system:

- Improved winter and summer flows in the Deschutes River
- No cost to alter the current canal infrastructure system and surrounding land,
- Net positive impact on local groundwater systems instead of declines,
- No impact to habitats, animals, and trees potentially dependent on the canals,
- AID could potentially obtain groundwater rights for the recharged winter surface water.

Impact	Full Piping of AID	Ag-MAR Operations
Improve winter flows in Upper Deschutes River	No	Yes
Improve summer flows in Lower Deschutes River	Yes	Yes
Canal alteration costs	High	None
Disruption of canal-area habitats	High	None
Local groundwater declines	Yes	No
Patron pumping costs	Lower	Higher

Ag-MAR has been demonstrated to be an effective water management technique in other semi-arid systems of the western United States (Niswonger et al., 2017; Kourakos et al., 2019). An Ag-MAR system very similar to the one proposed above has been evaluated in the Walla Walla Basin of Oregon and Washington. Detailed models of winter Ag-MAR suggest that the system can support irrigation needs, raise groundwater levels, and increase summer river flows (Scherberg et al., 2014; Scherberg et al., 2018). A thorough investigation into the feasibility of Ag-MAR in the AID is needed before determining the most effective way to restore water to the Deschutes River.

c. Aquifer Storage and Recovery (ASR) Alternative

An Aquifer Storage and Recovery system injects water treated to drinking water standards through wells into subsurface aquifers and recovers the water by pumping the wells. This type of system could meet some or all of the Purpose and Need for Action criteria (water conservation, improved reliability, and public safety) if fully evaluated. A full evaluation of ASR technology requires an in-depth knowledge of the local and regional hydrogeologic framework of the project area. A typical ASR Feasibility Study includes the evaluation of local geology, hydrogeology,

water quality, treatment options, identification of regional groundwater aquifers and local shallow water-bearing zones, groundwater modeling, an analysis of water injection rates and simulations of the groundwater model to assess impact of groundwater mounding. An additional benefit of ASR is the preservation of the original surface water right priority date for AID. Any new ASR system would work under an ASR Limited License and would not require the surrender of senior water rights. The ASR option was not evaluated or reported by the Draft AID EA. This option should be considered and an ASR Feasibility Study completed before this innovative technology is dismissed.

The Oregon Water Resources Department offers a competitive grant program for evaluation of subsurface storage options that includes ASR and Ag-MAR. The OWRD program provides up to 50% matching funds to pay for the evaluation. It does not appear that AID considered applying for funding to evaluate either the Ag-MAR or the ASR option within the project area. This funding option could assist the District with the evaluation.

7. The Draft Plan-EA Utilizes an Inappropriately narrowly defined Planning/Study Area, and inconsistent and shifting uses of scales used for purposes of analysis of effects.

As an initial matter, NEPA and its implementing regulations require the scale of a federal agency's NEPA analysis to be based on the environmental effects of a Proposed Action, not on what the National Watershed Program Manual defines as a "watershed area," which has a totally different underlying purpose, as outlined above.

Next, even borrowing from this definition, the "Planning Area" in the Draft Plan-EA as turning on what it refers to as the "irrigation problem area" referenced in the National Watershed Program Manual is entirely too narrow. The Manual after all is just guidance, and the purpose of Pub. L. No. 83-566 is to address problems in "watersheds." As the Draft Plan-EA indicates, this definition of Planning Area leads it to be just over one percent of the applicable subwatersheds in which the Project will fall, let alone the entire Upper Deschutes Basin watershed. Moreover, nowhere does the Draft Plan-EA explain or disclose how FCA arrived at the "irrigation problem area." Second, however calculated, it clearly must encompass more than just AID and should ideally take in the Upper Deschutes Watershed.

Moreover, one of the Principles to be followed in NRCS's evaluation of any proposed Federal investment in water resources now and into the foreseeable future is to ensure the use of a "Watershed Approach." P&R at 5-6 ("A watershed is land area that drains to a common waterbody. A watershed approach to analysis and decision making facilitates evaluation of a more complete range of potential solutions and is more likely to identify the best means to achieve multiple goals over the entire watershed"). This Principle is expounded upon in the Interagency Guidelines ("IAG"), which provides that utilization of a watershed approach to water resources management "requires a structured consideration of watershed needs and how alternatives under consideration serve those needs. *Minimally, the study area should include the watershed, but could also include other areas since there may be impacts outside of it.*" IAG at 15. Moreover, an agency's specific procedures are agencies must update, revise, or replace these processes, in accordance with the Interagency Guidelines. *Id.* at 16. Moreover, no explanation of how FCA ensured collaboration with stakeholders affected by the proposed Project, including with respect to "identifying the study area," as required.

8. The Draft Plan-EA is also unduly narrow in scope given its failure to address all of the Basin’s ongoing piping projects as “connected,” “cumulative,” and/or “similar” actions as required or urged by NEPA regulations.

In defining the scope of an agency’s NEPA analysis, CEQ’s implementing regulations require an agency to consider three types, namely “connected actions, which means that they are closely related and therefore should be discussed” jointly in a single NEPA analysis; “cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed” in the same NEPA analysis; and “similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography.” 40 C.F.R. § 1508.25(a).

9. The Draft Plan-EA is based on a flawed and legally insupportable use of “Tiering” under the CEQ’s NEPA Regulations.

The “Tiering” strategy on which the Draft Plan-EA’s environmental analysis is based is wholly inconsistent with and violative of CEQ’s NEPA regulations. See Draft Plan-EA at 7.

First, NRCS will simply need to perform further NEPA analysis (with corresponding opportunity for public review and comment) such as in a Supplemental EA because of its concession that “this Plan-EA does not identify the specific details associated with the engineering design and construction activities that would be required to implement the proposed action,” while inconsistently stating in the very next sentence that the document “intends to present an analysis in sufficient detail to allow implementation of a proposed action.” Draft Plan-EA at 7. In other words, the Draft Plan-EA states that although it does not provide details necessary for implementation of the proposed action, at the same time its objective is to provide environmental analysis at a sufficient level to warrant that implementation the very details of which it expressly fails to provide. This is not only internally inconsistent, but legally deficient.

Nor can NRCS cure this defect by preparing an “Environmental Evaluation” down the road because it is not a NEPA document, and a federal agency is precluded from tiering to a non-NEPA document, or seeking to cure a NEPA flaw in a non-NEPA document. Plus, there is apparently no opportunity for public review and comment associated with NRCS’s preparation of an Environmental Evaluation, thereby insulating important details important to understanding the Plenary Piping Alternative’s environmental effects from public input and skirting this critically important element of the NEPA process. Analysis of environmental analysis cannot be deferred if the effect is to shield it from public scrutiny. The Draft Plan-EA’s Tiering strategy is also internally inconsistent insofar as it states that an individual Environmental Evaluation would be prepared “prior to the implementation of *each* site-specific project,” implying that there are multiple such projects, while also stating that the proposed action would be completed in a single “project group.” Draft Plan-EA at 7. The Final EA needs to rectify this problem and clarify whether NRCS intends to prepare a separate site-specific EA that provides the requisite implementation details sufficient to assess environmental effects consistent with NEPA for each construction phase of the Proposed Action,” or just a single EA for all five construction phases.

B. ANALYTICAL INADEQUACIES & ISSUES RELATED TO GROUNDWATER AND HYDROLOGICAL EFFECTS

10. The Draft Plan-EA inaccurately represents USGS study findings regarding the local effects of canal piping on groundwater levels in the AID.

The Bureau of Reclamation got it right when in their document Water Reliability in the West - 2021 SECURE Water Act Report they summed up groundwater issues:

“Groundwater is an unseen, yet critical, water resource for many communities throughout the West. Given unique aquifer properties, local precipitation, topography, and land use; groundwater resources in any particular location are challenging to assess. (Reclamation, 2021)”

The Draft Plan-EA contains no project-level assessment of the geology or hydrogeology, nor does the AID PIR. The Draft Plan-EA relies on basin-level estimates in Section 1.1.1.4 Groundwater and references basin wide impacts that were recorded miles north of the project area. Completing local hydrogeologic study within the project area is critical. It is the local groundwater system and groundwater users close to AID Canals that are the parties most likely to be impacted by piping the AID Canals.

More specifically, Section 4.8.5, the Draft Plan-EA states as follows: “The study [Gannett and Lite, 2013] predicted an approximate 5- to 14-foot decline in groundwater levels in the central part of the Basin, which lies north of the proposed project area. The study found that 60 to 70 percent of the measured decline was associated with climate variations, 20 to 30 percent of the measured decline was associated with increased groundwater pumping, and 10 percent was associated with canal lining and piping. At the basin-scale, natural climate-induced fluctuations in groundwater discharge largely mask the effects of development on discharge from the regional aquifer (Gannett et al. 2001).” Draft Plan-EA at 34.

The foregoing excerpt demonstrates how the Draft Plan-EA repeatedly and incorrectly uses basin-scale averages to represent maximum expected local impacts when it comes to groundwater responses to piping. The USGS report (Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon; Gannett and Lite, 2013) frequently cited in the Draft Plan-EA does conclude that on the scale of the Deschutes Basin, climate variation did account for a majority of the groundwater declines observed and modeled over the 1997-2008 study period. However, Gannett and Lite also stated within their study that the proportional impacts to groundwater levels of climate variation, increased pumping, and canal piping are not evenly distributed over the region: *“Water-level changes in some parts of the upper Deschutes Basin, such as the La Pine subbasin and upland areas, are due to climate influences and are largely unaffected by pumping and canal lining. Simulated water levels in the more developed central part of the upper Deschutes Basin (the area encompassing Sisters, Bend, Redmond, and Powell Butte) show the effects of increased pumping and decreased recharge due to canal lining in addition to climate variations”* (Gannett and Lite, 2013, page 19). Canal lining and piping in some areas of the central basin therefore account for more than 10% of observed declines. For example, the study reports that the area east of Sisters, 15-17.5% of 20-25 ft declines since 2000

are connected to loss of canal leakage (Gannett and Lite, 2013, page 23). Gannett and Lite conclude that typical declines in the central basin, which they define as the area generally between Bend and Redmond, “generally ranged” 5-14 ft, about 10% of which was caused by canal lining or piping (Gannett and Lite, 2013). They point out that in areas adjacent to major canal systems that were lined or piped, such as areas around Tumalo and north and east of Bend, experiences much greater declines (Gannett and Lite, 2013, page 28). The study concludes by stating, “*Water-level changes are dominated by climatic influences. In the central part of the basin, however, increases in groundwater pumping and decreases in recharge due to canal lining have significantly contributed to water-level declines*” (Gannett and Lite, 2013, page 33). This conclusion is directly contrary to the assumptions in the Draft Plan-EA. A local hydrogeologic evaluation of the Project Area therefore needs to be completed for the Final EA-Plan to accurately assess the likely much greater declines than the generic levels suggested by the Gannett and Lite study on which the Draft Plan-EA almost exclusively relies that have led it to include a misleading analysis of effects on groundwater.

The AID is outside or on the periphery of the central basin as defined in Gannett and Lite, 2013. The study also concludes that “*the effects from increased pumping and decreased irrigation canal leakage extend south into the Bend area*” from the COID area (Gannett and Lite, 2013, page 1). Gannett and Lite admit that their model likely “dampened” the impacts of pumping and canal piping in the Bend area due to the limited number of wells with available data, and the fact that the available wells were in close connection with the Deschutes River (Gannett and Lite, 2013, page 1). Despite this, the USGS model predicted much greater groundwater level declines in the AID area due to canal lining and piping than reported in the Draft Plan-EA. For wells in the AID in the upper 100 ft of the regional water table, 1.0-49.9 ft of groundwater decline was estimated between 1997 and 2008, with the largest impacts in the northern and eastern sections of the AID. All deeper wells (200-300 ft below regional water table) in the AID experiences 1.0-4.9 ft of decline attributable to reduced canal leakage. The model did not include perched shallow water-bearing zones, which provide water to dozens of wells in the AID area (CwM, 2021), and which would experience the brunt of the reduction in recharge from unlined canals (Gannett and Lite, 2013).

The 1.0-49.9 ft of groundwater declines in the AID from 1997-2008 due to canal piping were largely due to piping activities outside of the AID. Piping of COID canals during this period resulted in an estimated 50.0-68.3 ft of decline locally northeast of Bend, which increased the southwest-to-northeast regional groundwater gradient between COID and AID (Gannett and Lite, 2013, Figure 28). The impact of COID piping, along with some lining and piping of laterals within the AID, contributed to the 1.0-49.9 ft of decline in the AID. It is also worth noting that the groundwater effects of canal piping from 1997-2008 were based on a basin-wide reduction in canal leakage of 58,000 AF/year. The completion of the AID piping project is expected to reduce leakage by approx. 10,500-14,600 AF/year (AID, 2019; AID, 2021), yet this change will be concentrated on the AID area alone and not spread across the central basin. The amount of leakage reduction expected in AID is comparable to the reduction in COID from 1997-2008 that lead to 50.0-68.3 ft of declines locally (Gannett and Lite, 2013).

The Draft Plan-EA takes basin-wide impacts of canal piping and lining and applied them to the relatively small area of the AID. In reality, the expected reduction in groundwater recharge from

the AID project will concentrate the groundwater impacts on those wells within close proximity of the canals. Based on the modeled impact of COID canal alterations, the USGS model suggests that a close proximity may be on the order of a mile or more (Gannett and Lite, 2013). A more detailed site-specific study of the AID area is needed to accurately predict the possible groundwater impacts of canal piping. CwM-H2O completed a preliminary assessment of the likely impacts to groundwater wells within one-mile of the AID main canal and found approx. 8 to 42 feet of likely declines. These impacts effect over 500 wells based on water well records recorded at OWRD for wells within one mile of the AID canals (CwM, 2021). The Draft Plan-EA does not assess any of these significant impacts or costs to groundwater users near the Canals. This failure to assess real impacts to local drinking water supplies and the cost of well deepening in addition to additional pumping costs feeds into the economic analysis in the Draft Plan-EA completed by Highland Economics. The economics assessment relies on flawed assumptions and incorrect cost estimates for mitigation of groundwater impacts.

11. The Draft Plan-EA includes an inaccurate generalization of USGS study findings regarding the local effects of canal piping on groundwater levels in the AID.

Section 6.8.2.3 of the Draft Plan-EA states as follows: *“On average, for this part of the Deschutes Basin, this decrease in recharge translates into a decreased groundwater elevation of approximately 0.028 foot annually (see Appendix D 1.1.4.1 for calculation details). An important caveat is that localized effects on groundwater would differ throughout the area. These effects would be most prominent at shallow depths closest to canals and attenuate with increasing depth (Gannett and Lite 2013).”*

The Draft Plan-EA depends on the Gannett and Lite studies for its estimations of groundwater declines in response to piping the AID system, specifically the figure of 5-14 ft of decline in the central basin. The EA then reasons that 0.5-1.4 ft of decline was incurred by canal piping and lining, based on Gannett and Lite’s estimate that 10% of declines were caused by reduced canal leakage to groundwater. These values were then interpolated based on the total reduction in recharge volume in the basin (58,000 AF/year) and the length of the study period (12 years from 1997-2008) to arrive at a predicted 0.028 ft/year of decline in response to the AID piping project. The groundwater cost and carbon cost estimates presented in the Draft Plan-EA fully depend on this one erroneous value.

The Draft Plan-EA does not accurately apply the conclusions of the USGS modeling study during this process. The figures initially used, 5-14 ft of decline, are stated as general declines across a large portion of the Upper Deschutes Basin. As explained above, the same study cited in the Draft Plan-EA concludes that 1.0-49.9 ft of decline occurred at moderate depth within the AID area between 1997 and 2008 due to canal lining and piping alone, with declines increasing west to east across the District (Figure 28 in Gannett and Lite, 2013). This large effect was due primarily to canal piping several miles north of the AID along COID canals. USGS modeled declines were not in response to the 58,000 AF/year of leakage reduction for the entire basin, but instead to approximately 20,000 AF/year of reduction within the COID and AID. Canal piping and lining west of the Deschutes River (TID and TSID), north of the Crooked River (NUID), or very far down-gradient from AID (such as in the norther portions of COID) would not affect groundwater levels below AID land, a fact which the Draft Plan-EA itself erroneously claims (AID EA Section 6.13.3.8, page 85).

Following the same calculation methodology as used in the Draft Plan-EA, using an intermediate decline value from the USGS model of 20.5 ft for the AID, and the estimated local recharge loss value of 20,000 AF/year, we arrive at an estimate of approx. 0.166 ft/year of decline on average for the AID area, or about 6 times the Draft Plan-EA rate. Over the 100 year life of the project, this would amount to 16.6 ft of decline on average, and potentially reaching about 30 ft near the main canal. This is a conservative estimate for three reasons. First, the values from the USGS model for the AID area are in response to a more distant piping action in COID. An equivalent action within the AID would result in a larger local impact than estimated here, and one likely comparable to estimated local declines in southern COID (50-68.3 ft). Secondly, the estimate of 0.166 ft/year of decline is still assuming that 90% of the declines in AID from 1997 to 2008 were due to climate variation and groundwater pumping. Though this estimate may be accurate for the region as a whole (i.e. across the entire Deschutes Basin, it is likely that canal recharge has a greater role in the AID than basin-wide. This assumption is supported by local observations of rapid groundwater response to canal wetting and drying (Caldwell, 1998). Lastly, all of the estimates described above are based on USGS modeled declines in the upper 100 ft of the regional water table, which occurs at a depth of about 500-600 ft (OWRD, 2016; AID, 2021), which is only a part of the impact to groundwater users within a mile of the AID Canals. Many AID area wells depend on shallower, perched water-bearing zones 150 ft or more above the regional water table that would experience greater effects than lower units. No impact analysis was provided in the Draft Plan-EA for these groundwater users. As stated in the USGS report, *“the effects of canal lining, in contrast, are most prominent at shallow depths closest to canals, and attenuate with depth”* (Gannett and Lite, 2013). Some shallower groundwater units are greatly or fully dependent upon canal leakage to maintain saturation (Gannett et al., 2001). Wells in shallow water-bearing zones may become dry due to the reduction in recharge. A survey of OWRD-listed wells in the AID identified more than 90 wells in the AID with less than 25 ft of available head and more than 250 wells with less than 50 ft (CwM, 2021). If piping the canals impacts the AID groundwater users similarly to the piping of the COID, there could be up to 250 wells that lose their source of drinking water. This impact is not addressed in the Draft Plan-EA.

12. The Draft Plan-EA fails to distinguish local conditions and effects from basin-wide factors.

Section 6.8.2.3 of the Draft Plan-EA further states: *“As described in Section 4.8.5, changes in canal seepage account for only a small portion of historical changes in groundwater recharge in the area. Climate remains the primary factor affecting groundwater levels in the region. The U.S. Geological Survey estimated that the combined effects of climate and groundwater pumping accounted for approximately 90 percent of the observed decrease in groundwater levels in the region and that canal piping and lining accounted for 10 percent of that observed decrease (Gannett and Lite 2013).”*

As stated above, the erroneous use of a basin-wide estimate of groundwater impacts in Section 6.8.2.3 fails to address the actual likely impacts to groundwater levels and groundwater users near the AID Canals. There are several hydrogeological factors that suggest canal leakage plays a greater role in maintaining groundwater levels in the AID than basin-wide. The AID area is underlain by the Newberry Volcano basalt lava flows which can extend to a depth of over 200 ft

(Sherrod et al., 2004). The Newberry is porous, fractured, and is exposed at the surface, allowing canal seepage to infiltration deeply into the ground. Groundwater level and isotope sampling data from near AID indicates that canal seepage can reach wells within a few days and can often increase water levels 10 ft and even up to 90 ft (Caldwell, 1998). The Draft Plan-EA looks at basin-wide recharge source data (Gannett et al., 2001; Gannett and Lite, 2013) to determine that approx. 10% of recharge comes from canal leakage. However, the EA fails to account for the fact that nearly half of precipitation recharge from the High Cascades discharges to surface water west of the Deschutes River and into the river itself, and that most of the canal leakage recharge is concentrated in a relatively small area of the central and northern part of the basin (Gannett et al., 2001; Sherrod et al., 2004; Gannett and Lite, 2013). Therefore, when considering the AID area alone, canal leakage is a considerably larger portion of the overall water budget. This is demonstrated by comparing the groundwater responses of wells west and east of the Deschutes River to recharge in the Cascades and recharge from canal activity (Caldwell, 1998; Gannett & Lite, 2013). The unique geology and geographic location of the AID is not assessed in the Draft Plan-EA and compounds the errors in the assumptions made regarding the degree of impact and cost of impacts to groundwater users and property values. Replacing drinking water sources for up to 250 individual well sites is not considered in the Draft Plan-EA.

Several faults of the southern Sisters Fault Zones in the Newberry and in the underlying Deschutes Formation cross through the AID northwest to southeast. The offsets of four or five of these faults are visible at the surface and likely alter groundwater flow in the area (Gannett et al., 2001). The faults were included in the USGS basin model as horizontal flow barriers due to data suggesting the fault surfaces restrict horizontal groundwater movement (Gannett et al., 2017). Canal leakages in between faults may therefore be restricted from spreading down-gradient, effectively increasing the mounding effect of the canal recharge, and expanding the canal's role in maintaining high groundwater levels in these areas. The corresponding decline due to canal piping would also be greater in between the fault barriers. The effect of the local structural geology on the rate of water loss from the canals and how it might amplify the impact to groundwater levels due to piping is not addressed in the Draft Plan-EA. This should be assessed in a full hydrogeologic investigation of the local AID project area.

13. The Draft Plan-EA contains conflicting arguments regarding the interconnection between groundwater in various irrigation districts.

Section 6.13.3.8 of the Draft Plan-EA states: *“Because AID is up gradient in the groundwater system, its projects may affect groundwater within COID. TID’s ongoing project and LPID’s reasonably foreseeable project are not proximal to AID and therefore would have no effect on groundwater levels in AID. For reference, TID’s project is located on the west side of the Deschutes River and LPID is located on the north side of the Crooked River (Figure 1-1).”* In this section the Draft Plan-EA claims that there is no impact from TID and LPID because of their location west or north of major rivers. In a section of one of its appendices, however, the document claims that seepage from NUID, which is also on the northside of the Crooked River, will provide mitigation to the groundwater system, as elucidated below.

That is, Section 1.1.1.4 of Appendix D to the Draft Plan-EA states: *“Some of the conserved water would be conveyed in unlined NUID canals and would seep into the ground and recharge*

groundwater. An analysis of NUID’s conveyance system suggests that around 35 percent of the water passed by AID to NUID would be lost to seepage and evaporation for a total of 3,642 AF seeped per year (Farmers Conservation Alliance, 2021). The increased seepage in NUID would likely partially offset the decreased seepage in AID, with the result of slightly less impact on groundwater pumping costs than estimated in Table D-2. Since only the potential costs of reduced AID seepage savings are accounted for in this analysis, the result is likely an overestimate of the basin-wide increase in groundwater pumping costs.”

This suggests that the concepts of the local and cumulative impacts to the hydrogeologic environment and interactions between groundwater, the Deschutes River, and various irrigation systems is not well represented by the Draft Plan-EA. The document appears, at times to be written to support convenient lines of argument to support the purpose and need of the Draft Plan-EA but can not be mutually supported by the factual data that has been omitted from consideration in the Draft Plan-EA in cited literature. Within the same document, the Draft Plan-EA makes conflicting claims regarding the interaction of groundwater effects from canal piping in various districts. First, the argument is made that simultaneous canal piping projects in other central Oregon districts will not compound groundwater impacts from AID’s project. The reasoning presented is that other projects are separated from the AID by the Deschutes and Crooked Rivers (hydraulic boundaries) or by great distance or difference in groundwater elevation. This reasoning is accurate with the exception of more proximate COID canals, which the EA mentions as being subject to compounding effects. The same argument is contradicted in a different section of the document when calculating the costs of groundwater declines. The EA claims that increased canal seepage from the unlined NUID system (to which the conserved AID water would be transferred after piping) would partially offset reduced seepage in the AID and therefore reduce groundwater declines and cost of pumping. Both of these claims cannot be possible at the same time. The AID and NUID are separated by more than 10 miles and by the Crooked River. Just as these hydrogeologic factors prohibit significant compounding of groundwater declines between these regions, they would prohibit canal seepage in NUID from beneficially affecting groundwater levels below the AID project area.

14. The Draft Plan-EA Fails to Adequately Evaluate or Account for Impacts to Local Groundwater Users.

“Water-level changes are dominated by climatic influences. In the central part of the basin, however, increases in groundwater pumping and decreases in recharge due to canal lining have significantly contributed to water-level declines...the effects of canal lining, in contrast, are most prominent at shallow depths closest to canals, and attenuate with depth” (Gannett and Lite, 2013).

“Canal leakage is a significant source of local recharge in the more arid areas where recharge from precipitation is minimal...The similarity in the isotopic composition of water from canals and nearby wells suggests that canal leakage is a significant source of recharge to the wells.” (Caldwell, 1998).

The ultimate groundwater-related conclusion of the AID Draft Plan-EA is that the economic impact of canal piping on groundwater resources will be miniscule in comparison to the project

benefits. A detailed economic analysis is presented in order to support this conclusion. However, the entire analysis is based on a single, incorrect assumption that completely invalidates the study. The Draft Plan-EA takes basin-wide averages from the USGS studies (Gannett and Lite, 2013 & Gannett et al., 2017) and applies them directly to the AID area without any adjustments for proximity to the canal. Within those same studies, the USGS concludes that, while basin-wide average impacts of canal piping and lining may be minor, significant impacts are expected in close proximity to the canals.

The same USGS models that the Draft Plan-EA references present a disturbing forecast of the impacts groundwater users in the AID may experience in response to canal piping. The USGS model is based on historic data from the period during which approx. 10 miles of the main Central Oregon Irrigation District (COID) canal was lined. The model estimated that the lining of this reach of the canal northeast of Bend resulted in a 10,001-16,983 AF/year decrease in groundwater recharge due to reduced canal leakage. As a result, groundwater levels in the upper 100 ft of the deep regional aquifer were predicted to decline between 10 and 50 ft in 11 years and as far as 3 miles away from the canal itself (Figure 28, Gannett and Lite, 2013). Up to 1 mile from the canal, groundwater declines of up to 68.3 ft were predicted.

In comparison, piping of the AID canal is expected to reduce canal leakage by over 10,500 AF/year, analogous to the modeled reduction in the USGS model. The COID canal that was lined was a single, linear canal stretching for approximately 10 miles. The proposed AID piping project will target 13.2 miles of its main canal, yet these reaches of canal are sinuous and branching. This means that, in effect, the AID project will reduce groundwater recharge to a degree comparable to the COID project, yet across a smaller area.

There are few places within the AID that are more than 1.5 miles from the open canal and the District is less than 5-miles across north-to-south. The groundwater declines in the AID then, based on the USGS model predictions, could be expected to exceed 10 ft in 11 years across the entire service area. At a distance of 1 mile from the canal, groundwater declines could exceed 50 ft in the first decade. This is in stark contrast to the 0.028 ft of declines based on regional averages and used by the Draft Plan-EA to justify their economic analysis.

Both the USGS studies and previous studies by Caldwell (1998) acknowledge that some wells in the central Deschutes Basin depend on shallow water-bearing zones (WBZs) that are 150 ft or more above the regional water table modeled in the USGS study. These shallow WBZs are the first to intercept percolating canal recharge as it travels down towards the regional water table (Figure 2a and 2b from CwM, 2021). Although they may be connected to the Deschutes River to the west, the influence of the river lessens with distance from the recharge source. This means that some parts of these shallow WBZs are completely dependent upon canal leakage to remain saturated and provide water to those water users. The groundwater declines in shallow WBZs are not directly modeled by the USGS, but are expected to be even greater than the impacts to the regional water table.

A preliminary search of registered groundwater wells in the AID determined that there are a total of 555 wells in the Oregon Water Resources Department database within 1.0 mile of the open AID canals, Table 1- Potentially Impacted Wells and attached Figure 4c (CwM, 2021). More

than 70% of these wells were located in the upper portion of the regional water table or were located in shallow, perched water-bearing zones (attached Figure 5 from CwM, 2021). Based on the data presented from the USGS groundwater model, all wells could be expected to see 1 to 5 ft of decline per year after the AID canal is piped. An analysis of available drawdown in these wells (based on initial static water levels and well construction data from the OWRD) suggests that there are 265 wells within 1.0 miles of the AID canals that have less than 50 ft of available drawdown. These wells could go dry within a decade or less in response to the canal being piped. There are 90 wells with less than 25 ft of available drawdown. The wells of this group closest to the main canal could potentially go dry within just a few years.

The Draft Plan-EA concludes that the cost of groundwater declines from canal piping are purely for increased pumping costs. The EA further assume that declines are minimal, totaling just 0.028 ft/year, resulting in just \$5,000 of increased pumping costs. Not only is this a gross underestimation of increased pumping costs from much greater local declines, but it does not consider the costs of well deepening. The preliminary assessment of area wells identified 90 domestic wells at high risk of going dry within 10 years, and more than 200 others that could experience the same fate. Deeping all of these wells would incur significant additional costs to the water users, who would not be able to claim injury due to the loss of recharge from the AID canals.

15. The AID Preliminary Investigation Report and Draft Plan-EA Appear to Contain Substantial Inconsistencies regarding current AID Main Canal Water Loss Estimates.

Section 1 of the Draft Plan-EA states: *“Approximately 45 percent of the water diverted into AID’s Main Canal seeps into the porous, volcanic geology or evaporates prior to reaching District patrons.”* Section 4.8.5 further provides in this regard as follows: *“AID’s Main Canal loses an estimated 32.5 cfs of water during the irrigation season (10,526 acre-feet annually), due to a combination of seepage related to the condition of the distribution system and permeable nature of the underlying soil and rock, and evaporation.”* Moreover, during the Power-Point presentation provided at the public meeting on June 23, 2021, it was represented both on a slide and orally that approximately 39 percent of the water in AID’s Main Canal would be lost due to seepage. Pub. Mtg. at 13:49-14:00. See also Draft Plan-EA at 9 & App. E4.

The two values for seepage loss presented in the Draft Plan-EA do not appear to agree with each other or the estimates from the AID Preliminary Investigation Report (AID-PIR, 2019) or what was represented during the recent public meeting. The AID-PIR states that 39% of water in the canal is lost due to seepage and other canal inefficiencies (presumably evaporation and canal “recharge time”). This 39% loss was estimated to be 45.1 cfs of diverted flow. Loss data presented in the AID-PIR was based on the 2016 LAP study (Crew, 2017), which collected flow measurements at points along the main canal and laterals to attempt to estimate loss. The AID-PIR projected that the 45.1 cfs loss rate corresponded to 14,607 AF of water lost each year.

The Draft Plan-EA uses estimates from the 2016 LAP study for all water conservation and cost-benefit analyses. The Draft Plan-EA states that 45% of water is lost in the canal, corresponding to 10,526 AF/year. The differences in the two loss figures (39% vs 45%, 14,506 vs 10,526 AF/year) are not explained. Working backwards from these two figures arrives at very different

values for total diversion into the canal. Based on AID-PIR numbers, the total diversion into the AID main canal would be 115.6 cfs. In comparison, the numbers from the Draft Plan-EA would suggest 72.2 cfs of diversion into the canal. In addition, in a review of the data collection for the LAP study completed by CwM found that data collected included up to 30% fair to poor measurement of flow velocity often leading to measurement of greater flow volume moving downgradient in the irrigation canal. The LAP study is of marginal value if the fair to poor estimate of flow rate are included in their estimate of overall loss of seepage water to groundwater. The OWRD study cited in the Draft Plan-EA as validating its seepage loss estimates, Draft Plan-EA at E-4, was not made available for review at the time the draft was made available for public review. Upon a follow-up request for the “study,” all that was supplied to the Ranch was a one-page spreadsheet entitled, “AID Sept 2019 Water Loss Study by OWRD_clean,” which contains no explanation for how the study was conducted and contains just three numbers reflecting percentage of loss that range from 5.1 percent to 31.6 percent, all of which of course are substantially lower than even the lower of the numbers reflected in the Draft Plan-EA. It should also be pointed out in this context that the estimated water losses from AID’s canal are as high as two and a-half times the estimated water losses in the systems of other districts for which FCA has prepared EA-Plans, with no explanation for the disparity. In any event, the unexplained discrepancies that are in the Draft Plan-EA for a number that is so critical to the effects analysis and purported benefits offered by the proposed Project must be explained and reconciled for the Final EA-Plan.

C. ANALYTICAL INADEQUACIES & ISSUES RELATED TO INTERRELATED EFFECTS ON WETLANDS, RIPARIAN AREAS, VEGETATION, & WILDLIFE.

16. The Draft Plan-EA provides inadequate description of the affected environment and analysis of likely effects to wetlands and riparian areas (Sections 4.10 and 6.10.2).

Oregon’s OAR 141-085-0515(9)(a)(b) states that irrigation ditches, such as the AID canal, are not jurisdictional. However, the project area of potential impact (API) extends beyond the bed and banks of the canal system. To facilitate construction access, materials staging, side-casting, etc., the API must encompass a larger area than just the non-jurisdictional canal. As such, the API must be subject to a wetland and waters delineation, just like any other project. The National Wetland Inventory (NWI) data is used by the EA’s analysis, but NWI data is often incomplete and inaccurate. NWI is largely based on aerial photo interpretation, and it is typically not confirmed by on-the-ground site investigations. Furthermore, per OAR 141-085-0510(86), if wetlands or other waters of the state may be indirectly impacted due to the project (e.g., indirect impacts due to loss of hydrology or excess hydrology), they must be considered:

OAR 141-085-0510(86) “**Reasonably Expected Adverse Effect**” and “**Adverse Impact**” means the direct or *indirect*, reasonably expected or predictable results of project development upon waters of this state including water resources, navigation, fishing and public recreation uses.

The wetland delineation guidance in the OARs (141-090-0035(12)(e)(14)(f)) requires a disclosure of wetlands within the study area and those that extend offsite:

(12) Report Text: The report text must include:

(e) A description of any wetlands and other waters, including whether or not they extend offsite, and the characteristics of the wetland and other water boundaries on the site;

(14) The wetland and other waters map(s) must include:

(f) The boundaries of all wetlands and other waters and where they extend offsite;

The purpose of this requirement is to assess the connectivity to other waters of the state and to assess the potential indirect effects to such waters.

AID should therefore complete a wetland delineation not only within the project right-of-way but also within the area of the affected environment. In the case of wetlands and waters, the affected environment should include areas reasonably expected to be impacted by changes in the hydrology of the system.

17. The Draft Plan-EA contains an inadequate analysis of impacts to adjacent mature trees including ponderosa pines along AID’s Main Canal (Section 6.6.2).

The larger trees along the canal have developed biomass and metabolic systems that are artificially bolstered by the unnatural availability of hydrology in a high desert environment. Many of the mature trees adjacent to the proposed piping project would not die during the year or two following piping. Rather, delayed mortality could occur from a combination of weakening over time due to water stress and disease and bark beetle infestation of the weakened trees. As such, most of the mature trees that would die due to the piping project may not die for several years following project completion. These trees could become hazard trees if they are close to homes or other structures.

We understand AID based the statement found on p. 62 of the Draft Plan-EA on the experience of the Tumalo Irrigation District. The statement reads “Prior experience with piping projects has shown that 70 to 80 percent of the well-established trees within the project area would survive after piping with active irrigation by the property owner (20 to 30 percent of the trees that do not normally survive in such a location without the canal did not survive after piping)”. AID should consider not only the potential loss of mature trees that would result from the Main Canal project but also cumulatively throughout the basin as other similar piping projects are implemented by the nearby irrigation districts.

18. The Draft Plan-EA contains an inadequate discussion of likely effects to Wildlife (Section 6.11.2).

Piping the Main Canal would remove an open water source for wildlife. This could be significant for a wide range of species that use the area as summer range. Larger, more mobile species, such as mule deer and elk, would likely experience a smaller impact than species that depend on smaller home ranges and that require predictable habitat elements. Examples include birds that utilize nesting locations along the Main Canal. Many of these species exhibit strong nesting site

fidelity and would potentially be negatively affected by removal of the open water resource and changes to the adjacent vegetation community within already established nesting territories. The piping project would also remove sporadic occurrences of willows and alders along the canal. While these riparian species are uncommon along the canal, they do have the potential to provide nesting and foraging opportunities for birds.

19. The Draft Plan-EA contains an inadequate discussion of cumulative effects on Wildlife and Habitats (Sections 6.13.3.6 & 6.13.3.8-11).

The Project is located at the border of two large ecoregions in Oregon, the Blue Mountains and East Cascades. According to the ODFW Conservation Strategy, both ecoregions are experiencing conservation issues associated with water quality and quantity. Although this project aims to increase the efficiency of the irrigation system and conserve water it could have unintended local and regional impacts to the mosaic of wildlife habitats present on the landscape by changing the hydrology of the system. The habitats that are particularly sensitive to changes in hydrology are wetlands, streams, and riparian areas. Wetlands, streams, and riparian areas are also conservation strategy habitats due to their relative rareness and importance in providing food and cover to a variety of wildlife species, particularly in dry ecoregions such as the East Cascades and the Blue Mountains. The impacts of the proposed project are difficult to predict but should be considered more carefully than has been presented in this EA, particularly in combination with the other planned and already completed irrigation canal piping projects. Although AID asserts the effects of piping the Main Canal on these resources would be minor, the cumulative effects of planned piping projects among the several irrigation districts in the Deschutes Basin are not analyzed with the level of detail needed to understand the regional cumulative implications of the piping projects on these resources.

D. OTHER NEPA FLAWS AND ISSUES IN THE DRAFT PLAN-EA

20. The analysis in the Draft Plan-EA relies on a significant overestimate of the Proposed Action's potential benefits.

The Draft Plan-EA confidently asserts that 100 percent of water saved instream during non-irrigation system would be “protected” under the Proposed Action, Draft Plan-EA at 11, but this would appear to be a problematic assumption at best, given that any such water technically would appear to be available to junior water-right holders for diversion. Indeed, the only way to make sure that water is protected instream is for the District to avail itself of transfers for instream use, which will confirm the protection as a legal matter. Indeed, the Draft Plan-EA concedes that the water the District does not divert will be available for use by junior water holders. Draft Plan-EA at xii.

The projected benefits from piping are also substantially too uncertain particularly in light of how many other irrigation districts are already in the queue for sizable amounts of funds under the exact same federal program, Pub. L. No. 83-566. Therefore, there is no guarantee that the full amount of federal funding/grants will actually materialize, especially in the context of all of the other piping/infrastructure projects in the Basin that will be competing for the same funds. In this light, there needs to be some discussion in the Final Plan-EA of the impacts if such funding

does not fully materialize. Indeed, as the Draft Plan-EA concedes, all of the modernization projects within the Basin “are contingent on the availability of funding.” Draft Plan-EA at 82. The DBHCP further recognizes in this regard that “the costs of piping . . . will be substantial,” ranging from \$2 million all the way up to \$115 million, and will therefore “influence the financial ability of the Permittees to provide additional mitigation.” *Id.*

Nor is there any discussion of where the remaining approximately \$14 million the Plenary Piping Alternative is estimated to cost will come from. This is a major oversight that needs to be rectified in the Final EA-Plan.

Another key variable that warrants analysis and consideration in the Final Plan-EA is the acknowledgment that, even if the assumptions about water that will be able to remain instream during the non-irrigation season are borne out to the full extent projected in the Draft Plan-EA, it will not come even close to doing enough to meet the conservation needs of the listed Oregon Spotted frog. The U.S. Fish & Wildlife Service concluded four years ago, in 2017, that a minimum of 600 cfs in winter was needed to save that species. In this context, NRCS needs to compare the situation and whether it will truly be in the best interests of the public as a whole, in the light of the experience that has played out on Whychus Creek, where, despite years of publicly financed conservation projects in the Three Sisters Irrigation District, the creek still fails to provide adequate stream flows for spawning and migrating steelhead.

21. The Draft Plan-EA Fails to Properly Analyze Impact of Proposed Project on the Outstandingly Remarkable Values of the Wild & Scenic Deschutes River Corridor.

The EA provides a general recognition that the proposed project will create impacts on sections of the Deschutes River that are protected under the federal Wild and Scenic River Act (“W&SRA”), 16 USC §§ 1271 et seq., and Oregon Scenic Waterways Act (ORS 390.805-390.925) but improperly defers the identification of impacts and any necessary or associated mitigation measures until construction of the pipeline is scheduled to commence. (*See EA Sections 4.12 and 8.3.11*).

The section of the Deschutes River between Wickiup Reservoir and Bend’s Urban Growth Boundary is classified as a “Scenic” or “Recreational” waterway under the W&SRA. Federal resource planning, conducted by the USDA, identifies the following “Outstandingly Remarkable Values” (“ORV’s”) within these designated river segments: Cultural, Fish, Geologic, Recreation, Scenery, Wildlife and Vegetation. See Appendix E.7 to Draft Plan-EA at pp. E-25 – E-29. The affected river corridor area is also designated as a Scenic River Area under the Oregon Scenic Waterway Act, with new development governed by the requirements of OAR 736-040. Under state law, designated Scenic River Areas are administered to “maintain or enhance their high scenic quality, recreational value, and fishery and wildlife habitat, while preserving their largely undeveloped character and allowing continuing agricultural uses”. In addition, the river corridor area is protected under the Landscape Management Combining Zone under Section 18.84 of the Deschutes County Code. The EA provides little or no evaluation of the impact of governing local, state and federal rules/regulations on that portion of the project located within the Deschutes River canyon.

The proposed project will require the removal and replacement of the existing approximately one mile-long wooden flume that provides for the diversion of irrigation water from the Deschutes River. The District proposes to replace the first 450-feet of the flume with supports and an elevated piping structure at the approximate height of the existing flume. All remaining portions of the existing flume structure would be replaced by a buried pipeline along the route of the existing flume structure. EA Section 8.2. Because this section of pipe must be level with the aerial section, “the pipe would be buried above the existing landscape elevation and would hug the hillside”. (EA Section 5.3.2). The District anticipates covering the buried pipe with “a minimum of 3 to 4 feet of engineered backfill” and placing a new maintenance road on top of the buried pipe.

As noted above, the existing flume structure runs parallel to the Deschutes River for a distance of one-mile, located entirely within river corridor areas that are protected by local, state and federal regulations. The affected area is characterized by extremely steep topography, but the Draft Plan-EA fails to acknowledge this factor nor provide any data as to the percent grade of the terrain in which the significant construction work it proposes to replace the flume will be occurring. This area of the river corridor is also heavily vegetated with mature Ponderosa Pine trees and other native vegetation. There is currently no roadway access to this portion of the project area, requiring the construction of additional roadways to facilitate access for the heavy equipment necessary to complete construction. The proposed project will require the clearing and removal of mature trees and vegetation within the river corridor area to facilitate the planned construction activity. The District and its contractors will be required to conduct extensive grading activity (cut and fill slopes) to create roadway access, the planned pipeline corridor and its associated maintenance road. In addition, new roadway access will be required to create areas of “engineered backfill” over the buried pipeline to facilitate construction of the anticipated maintenance road.

The EA contains no reference to the steep slopes of the river canyon and the impact of existing topography on the feasibility of constructing required improvements within AID’s available easement corridor. Moreover, the EA contains no analysis of the impact of construction activity on the Deschutes River itself. In lieu of this required evaluation, the EA contains the following language that impermissibly defers its impact analysis until construction activity has commenced:

If determined necessary, mitigation measures to address any potential adverse effects on Wild and Scenic Rivers’ resources would be identified and formalized before construction and completed concurrent with or after construction. Potential mitigation measures could include, but not be limited to, actions such as ensuring that the flume would blend into the surrounding landscape, construction would occur within the ROW, and construction staging would minimize impacts to visual resources.

At a minimum, the EA must assess how its plan to remove large areas of existing vegetation and to conduct widespread grading activity will impact the natural and scenic resources of this protected river corridor area. The EA must address the potential for considerable erosion from the pipeline corridor area to the detriment of the river, water quality and associated areas of fish/wildlife habitat. In addition, the EA must evaluate and address the visual impacts of its

planned construction activity on the Wild and Scenic River corridor under applicable federal, state and local regulations.

For similar reasons, the Plenary Piping Alternative likewise violates the Wild and Scenic Rivers Act, which requires that “[e]ach component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values.” 16 U.S.C. § 1281(a). In this regard, the only assurances provided in the Draft Plan-EA are that “all new structures, improvements, and development would comply with the Land Management Rules as described in OAR 736-40-035 and OAR 736-40-040((1)(b)(B),” and that “[c]onsultation with Oregon Parks and Recreation Department and [the USDA-Forest Service] will occur prior to finalization of this Plan-EA.” Draft Plan-EA at 79. Nothing in these statements, however, even purports to explain how following the referenced rules will suffice to protect and enhance the Outstandingly Remarkable Values of the Upper Deschutes River at the location of the flume, particularly in light of the topography at that site, or to explain why such consultation with the referenced agencies has not already occurred or the results of such consultation. Without that information, it is virtually impossible to evaluate or have a meaningfully opportunity to comment on the likely significant effects on this stretch of the Wild and Scenic-designated Upper Deschutes River.

22. The Draft Plan-EA erroneously identifies no issues of controversy surrounding the Proposal.

The Draft Plan-EA, without a shred of explanation, justification, or discussion conclusorily states that “[t]here have been no areas of controversy identified.” Draft Plan-EA at xiv. This is a wholly unwarranted conclusion, likely arising from FCA’s myopic focus on piping wholly in accord with AID’s originally submitted Proposal, as well as NRCS’s failure to consult with private landowners who stand to be the most directly and severely affected by the Proposed Action as formulated by the District.

23. The Draft Plan-EA contains no discussion of or accounting for the effect of the lag in the timing for piping, which is particularly glaring given the urgency for swift action to address water conservation in the Upper Deschutes Watershed given the historic drought.

The Draft Plan-EA concedes that the project, even once approved, will take at least seven years to implement before the benefits it projects will be realized, and this assumes no construction, funding, or litigation delays. The situation demands swifter and more innovative thinking and alternative solutions that will benefit everyone in the Basin, including the irrigators. Indeed, at least one NUID patron has already stated that piping will take too long to save their farms. During testimony at a recent Oregon House of Representatives Water Committee Hearing on May 25, 2021, Cate Casad stated in her own words as follows: “I can’t stress enough that we don’t have time. A lot of the irrigation solutions, a lot of the piping projects are going to take some years to unroll, and we’re so excited to see those conservation projects send water this way, but I can promise you, based on last season, and based on the realities of this season, people who are seventh-generation farmers in this district [NUID] are seriously considering throwing in the towel because with each year of the 100-percent overhead costs to a 40 percent income, they’re

losing not just money, but they're watching their futures blow away in the form of their soil." On this basis, she explained that the Upper Deschutes River Basin Study identified that there is sufficient water in the Basin to support all of the needs of everyone who relies on it if water is better managed, leading her to conclude that "what we really have is a management issue," and advocating for solutions that allow for more equitable and efficient water management and sharing along the lines of the nonstructural alternatives proposed above given that many of the NUID farmers do not have "one more season in them like this one or the one last year."

24. The Draft Plan-EA fails to make any attempt to put the public safety risk on which it heavily relies as a basis for rejecting alternatives into any type of appropriate context.

The Draft Plan-EA notes that "unpiped canals in AID carry a risk of 0.0018 death per year" (Draft Plan-EA at D-28); see also Draft Plan-EA at 11 & 21, & D-28. Although any death is obviously a tragedy, and public safety is a legitimate consideration, in order to properly evaluate the level of this risk in the comparison of alternatives, some level of context needs to be built around it by comparing it to other kinds of similar risks, such as those from drowning in natural bodies of water or swimming pools. NRCS should provide this context in the Final Plan-EA.

25. The Draft Plan-EA Contains Inadequate Discussion/Analysis of Impacts to Socioeconomic Resources.

The Draft Plan-EA's analysis of impacts to socioeconomic resources fails even to reference or mention the dramatic loss in property values to private landowners who live along or near the main canal to be piped. Draft Plan-EA at 59-60. This oversight must be rectified in the Final EA and is made even more inexplicable by the fact that the benefit-cost analysis in Appendix D concedes that such diminution in value is a likely cost of the Plenary Piping Alternative. Draft Plan-EA at D-10. Even in this analysis, however, the plan makes no attempt whatsoever to provide for a quantitative evaluation of the impact on private landowners' property values, even though it concedes that their loss could reduce property values by up to 30 percent based on three studies it cites. Draft Plan-EA at D-10. By conceding as it must that this is a "likely cost" of the Plenary Piping Alternative, and yet refusing even to seek to quantify it for purposes either of its NEPA analysis or PL 83-566 cost-benefit analysis, the Draft Plan-EA fails on both fronts.

26. The Draft Plan-EA Contains An Inadequate Discussion of Cumulative Effects.

The Draft Plan-EA discusses cumulative effects at pages 81-88. The discussion fails to satisfy the standard in 40 CFR § 1508.7, however, given that, even though the other piping projects underway or proposed in the Basin are briefly mentioned, Draft Plan-EA at 82, only the most cursory, vague, and generic analysis is provided, particularly in regard to:

--Cultural Resources (Section 6.13.3.1)

--Vegetation (Section 6.13.3.6)

--Water Resources, especially related to groundwater (Section 6.13.3.8)

--Wetlands (Section 6.13.3.10)("implementation of the proposed action would not be anticipated to have a cumulative impact to wetlands in the Deschutes Basin")

--Wildlife (Section 6.13.3.11)

This appears to be a quintessential example of zooming in and out on the scale and scope of analysis to relieve the onus of providing an adequate cumulative impact analysis that can pass muster under NEPA's implementing regulations. This section needs to be bolstered considerably to provide much greater specificity on the cumulative effects of all of the piping projects instead of effectively representing that the impacts of each of the proposed projects of themselves are deemed to be minor, and therefore, taking them all together, they necessarily will be minor.

E. PROCESS ISSUES & CONCERNS

27. The Final EA-Plan Needs to confirm/clarify that construction activities will stay within the existing rights-of-way and easements, not just do so "[w]here possible."

The Draft Plan-EA states that construction activities will stay within the District's existing right-of-way and easements "[w]here possible." Draft Plan-EA at xii. This statement needs to be clarified for purposes of the Final Plan-EA to confirm that such activities will in fact remain within the District's existing right-of-way and easements and, if not, the costs associated with the physical takings of private property that would result need to be factored into its cost analysis.

28. NRCS failed to consult with landowners who will be most directly affected by the Proposed Action.

The Draft Plan-EA reveals an inexplicable failure to consult with any of the affected landowners. See Draft Plan-EA at 12. This oversight is particularly egregious given that the planning area is defined as 99.2 percent privately owned, Draft Plan-EA at xi, and "[t]he project area crosses nearly all privately owned land." Draft Plan-EA at 20. Nor is there any discussion of

29. NRCS needs to explain in detail how it independently evaluated and validated the analysis of environmental effects and the WRDA-07 PR&G analysis in the Draft Plan-EA.

The Draft Plan-EA contains no description of the steps NRCS has taken to review and independently validate analysis. The document indicates it was prepared by Farmers Conservation Alliance, and later simply identifies four individuals from the agency who were involved in its preparation without describing their roles. Draft Plan-EA at 114-15. This is wholly insufficient to meet NRCS's duty under NEPA's implementing regulations, which require the federal agency to independently validate a NEPA analysis carried out by an independent non-federal entity. 40 CFR 1506.5(a) & (b). The need to do so in this case is particularly salient given that much of the analysis in the Draft Plan-EA is essentially replicates that set forth in previous analyses FCA has prepared for other piping projects in the Basin and appears to reveal an Assembly Line approach inconsistent with an independent and rigorous analysis a project of this magnitude deserves and requires under the law.

F. INADEQUATE PR&G ANALYSIS TO QUALIFY FOR PL 83-566 FUNDING

30. The Draft Plan-EA Fails to Comply with PR&Gs for Pub. L. No. 83-566 Funding.

The Draft Plan-EA erroneously conflates and confuses NRCS's requirements under NEPA and those under Pub. L. No. 83-566, leading it to fail to comply with various required elements of the PR&Gs. For example, those provide that NRCS is to "describe and request public input on the PR&G analysis in the scoping NEPA process" and "clearly separate out what the agency wants to know for PR&G purposes and what is desired for NEPA purposes," PR&G at 6-7, which NRCS wholly failed to do here.

Moreover, NRCS appears to have not conducted a separate PR&G Planning and Evaluation Process. Similarly, it failed to engage in any meaningful collaboration with affected stakeholders representing the landowners in the area of the main canal, as required by PR&G. PR&G at 11-12. In addition, the Draft Plan-EA fails to explain how it follows the requisite eight-step PR&G Evaluation Process, nor is there any place in the document where such steps are explicitly identified and carried out.

The period of analysis in the Draft Plan-EA for its Pub. L. No. 83-566 analysis is not to exceed 100 years pursuant to PR&Gs at p. 19, and yet it utilizes 107 years. See, e.g., Draft Plan-EA at 59 n.22. This needs to be rectified, and the relevant analysis adjusted in the Final Plan-EA.

Finally, the Benefit-Cost analysis in the Draft Plan-EA is fatally flawed for various reasons alluded to above. For one thing, it fails even to attempt to quantify the costs associated with reduced property values of landowners. As another example, it fails to adequately account for costs associated with groundwater losses. Moreover, it utilizes the wrong time frames and standard parameters for conducting economic analyses for water infrastructure projects.

G. ERRATA

- Incorrect citation to regulations in Draft Plan-EA at 8 n.3, which should be 40 CFR § 1506.13.
- NMFS has not issued a final permit decision on Deschutes Basin HCP (Draft Plan-EA at 10).

Conclusion

We would be pleased to sit down and discuss any or all of the foregoing issues or concerns with you, and also be willing and eager to make our expert consultants available as well should you seek any clarification or have any questions about any of our comments. We look forward to continuing to work with you to improve upon the analysis FCA has conducted to date and help to ensure a legally adequate process and analysis that will consider a reasonable range of alternatives and lead to an outcome with broader public support and be substantially more cost-effective with much fewer environmental, cultural, and economic effects.

Attachments:

- Table 1- Potentially Impacted Wells (from CwM, 2021)
- Figures 4c & 5 (from CwM, 2021)

LIST OF REFERENCES

- Arnold Irrigation District, 2017. Arnold Irrigation District System Improvement Plan. Prepared by Black Rock Consulting & Farmers Conservations Alliance.
- Arnold Irrigation District, 2019. Preliminary Investigative Report for the Arnold Irrigation District Infrastructure Modernization Project. Prepared by Farmers Conservation Alliance.
- Arnold Irrigation District, 2021. Draft Watershed Plan-Environmental Assessment, Deschutes County, Oregon. Prepared by Farmers Conservation Alliance. June 8, 2021.
- Caldwell, R.R., 1998. Chemical Study of Regional Ground-water Flow and Groundwater/Surface-water Interaction in the Upper Deschutes Basin, Oregon. United States Department of the Interior, United States Geological Survey. Portland, Oregon.
- Colorado State University, July 5, 2021. Study proves cost-effective polymer sealant could significantly reduce irrigation water loss worldwide. Available at <https://phys.org/news/2021-07-cost-effective-polymer-sealant-significantly-irrigation.html>.
- Chan, Gabriel, Stavins, Robert, Stowe, Robert, Sweeney, Richard (2012), The SO2 Allowance Trading System And The Clean Air Act Amendments Of 1990: Reflections On Twenty Years Of Policy Innovation, National Bureau of Economic Research, Working Paper 17845 (available at <http://www.nber.org/papers/w17845>).
- Crew, Kevin. 2016. Central Oregon Irrigation District System Improvement Plan. Redmond, OR: Central Oregon Irrigation District.
- CwM, 2021. Hydrogeology and Water Management Options – Technical Memorandum. April 5, 2021. Portland, Oregon.
- Ewanyk, J. 2020. Habitat use and prey selection by mountain lions in an altered sagebrush steppe environment. M.S. Thesis, Humboldt State University, May 2020.
- Figueira, L., P. Martins, C.J. Ralph, J.L. Stephens, J.D. Alexander, and J.D. Wolfe. 2020. Effects of breeding and molt activity on songbird site fidelity. *The Auk*, 137:1-15.
- Gannett, M.W., Lite, K.E., Morgan, D.S., & Collins, C.A. 2001. Ground-Water Hydrology of the Upper Deschutes Basin, Oregon. United States Geological Survey. Water-Resources Investigation Report 00-4162. Portland, Oregon.
- Gannett, M.W., & Lite, K.E., Jr., 2013, Analysis of 1997–2008 Groundwater Level Changes in the Upper Deschutes Basin, Central Oregon: U.S. Geological Survey Scientific Investigations Report 2013-5092, 34 p.

- Gannett, M.W., Lite, K.E., Risley, J.C., Pischel, E.M., & Marche J.L., 2017, Simulation of Groundwater and Surface-Water in the Upper Deschutes Basin, Central Oregon: U.S. Geological Survey Scientific Investigations Report 2017-5097.
- Gavin, T. A. and E.K. Bollinger. 1988. Reproductive correlates of breeding-site fidelity in bobolinks (*Dolichonyx oryzivorus*). *Ecology*, 69(1):96-103.
- Hartwell, Ray, Kruse, Sarah, & Pilz, David, 2017, Technical Memorandum: LPE Task 7Market-Based Approaches as a Water Supply Alternative: Summit Conservation Strategies, 65 pp.
- Kourakos, G., Dahlke, H. E., & Harter, T. (2019). Increasing Groundwater Availability and Seasonal Base Flow through Agricultural Managed Aquifer Recharge in an Irrigated Basin. *Water Resources Research*, 55, 7464– 7492.
- Oregon Department of Fish and Wildlife (ODFW). 2016. Oregon Conservation Strategy, Oregon Department of Fish and Wildlife, Salem, Oregon. Accessible online at: Overview – Oregon Conservation Strategy.
- Oregon Department of Fish and Wildlife (ODFW). 2020. ODFW Compass Oregon Conservation Strategy Report. Generated at <https://compass.dfw.state.or.us> on December 21, 2020.
- Randall, C.B. 2004. U. S. Forest Service Management Guide for Western Pine Beetle. USDA, U.S. Forest Service. Available online at: Management Guide for Western Pine Beetle (usda.gov).
- Reclamation (Bureau of Reclamation) 2021. Water Reliability in the West - 2021 SECURE Water Act Report. Prepared for the United States Congress. Bureau of Reclamation, Water Resources and Planning Office. Denver, CO.
- Scherberg, J., Baker, T., Selker, J. S., & Henry, R. (2014). Design of Managed Aquifer Recharge for Agricultural and Ecological Water Supply Assessed Through Numerical Modeling. *Water Resources Management*, 28(14), 4971-4984.
- Scherberg, J., Keller, J., Patten, S., Baker, T. and Milczarek, M. (2018). Modeling the Impact of Aquifer Recharge, In-stream Water Savings, and Canal Lining on Water Resources in the Walla Walla Basin. *Sustainable Water Resource Management*. 4:275–289.
- Sherrod, David R., Taylor, Edward M., Ferns, Mark L., Scott, William E., Conrey, Richard M., & Smith, Gary A. 2004. Geologic Map of the Bend 30- X 60-Minute Quadrangle, Central Oregon. United States Geologic Survey. Reston, Virginia.
- U.S. Fish and Wildlife Service (USFWS). 2020. IPaC: Information for Planning and Consultation Tool. Accessed on December 21, 2020 at <https://ecos.fws.gov/ipac/>.
- U.S. Fish and Wildlife Service (USFWS). Various dates of metadata. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. <http://www.fws.gov/wetlands/>.