City of McMinnville
Planning Department
231 NE Fifth Street
McMinnville, OR 97128
(503) 434-7311
www.mcminnvilleoregon.gov

Planning Commission
Thursday, MAY 19, 2022

6:30 PM Regular Meeting

HYBRID Meeting
IN PERSON – McMinnville Civic Hall, 200 NE Second Street, or ZOOM Online Meeting

Please note that this is a hybrid meeting that you can join in person at 200 NE Second Street or online via Zoom

ZOOM Meeting: You may join online via the following link:
https://mcminnvilleoregon.zoom.us/j/87934391918?pwd=WW9zMXg0eTZKdUZhUmplbk5UWGVwZz09
Meeting ID: 839 3439 1918 **Meeting Password:** 930661

Or you can call in and listen via zoom: 1 253 215 8782
ID: 839 3439 1918

Public Participation:

Citizen Comments: If you wish to address the Planning Commission on any item not on the agenda, you may respond as the Planning Commission Chair calls for "Citizen Comments."

Public Hearing: To participate in the public hearings, please choose one of the following.

1) ***Email in advance of the meeting*** *– Email at any time up to 12 p.m. the day before the meeting to heather.richards@mcminnvilleoregon.gov, that email will be provided to the planning commissioners, lead planning staff and entered into the record at the meeting.*

2) ***In person at the meeting*** *- Testify in person at the McMinnville Civic Hall, 200 NE Second Street.*

3) ***By ZOOM at the meeting*** *- Join the zoom meeting and send a chat directly to Planning Director, Heather Richards, to request to speak indicating which public hearing, and/or use the raise hand feature in zoom to request to speak once called upon by the Planning Commission chairperson. Once your turn is up, we will announce your name and unmute your mic.*

4) ***By telephone at the meeting*** *– If appearing via telephone only please sign up prior to the meeting by emailing the Planning Director, Heather.Richards@mcminnvilleoregon.gov as the chat function is not available when calling in zoom.*

------- MEETING AGENDA ON NEXT PAGE -------

The meeting site is accessible to handicapped individuals. Assistance with communications (visual, hearing) must be requested 24 hours in advance by contacting the City Manager (503) 434-7405 – 1-800-735-1232 for voice, or TDY 1-800-735-2900.

*Please note that these documents are also on the City's website, www.mcminnvilleoregon.gov. You may also request a copy from the Planning Department.

Commission Members	Agenda Items
Sidonie Winfield, Chair Gary Langenwalter Vice - Chair Robert Banagay Matthew Deppe Sylla McClellan Brian Randall Beth Rankin Lori Schanche Dan Tucholsky	**6:30 PM – REGULAR MEETING** **1. Call to Order** **2. Citizen Comments** **3. Minutes:** **April 1, 2021** *(Exhibit 1)* **January 20, 2022** *(Exhibit 2)* **February 17, 2022** *(Exhibit 3)* **4. Public Hearings:** **A. <u>Quasi-Judicial Hearing: Zone Change (ZC 1-22), Planned Development (PD 1-21), and Subdivision Tentative Plan (S 1-21)</u>** – (*Exhibit 4)* Request: Proposed Zone Change from R-1 to R-3, Planned Development, and 18-lot Subdivision Tentative Plan for a 3.79-acre parcel. Location: The subject site is located on Meadows Drive, more specifically described as Tax Lot 204, Section 18, T.4S., R 4 W., W.M. Applicant: Westech Engineering, c/o Josh Wells representing property owner VJ2 Developers c/o Don Jones **B. <u>Quasi-Judicial Hearing: Comprehensive Plan Map Amendment (CPA 1-20) and Zone Change (ZC 1-20)</u>** – (*Exhibit 5)* ***Applicant has requested a continuance to June 16, 2022*** Request: An application for a Comprehensive Plan Map Amendment from Residential to Commercial and a Zone Change from County EF-80 to City C-3 (General Commercial) for approximately 1.2 acres of a 50.15-acre property. The 50.15 acre parcel is within McMinnville's Urban Growth Boundary (UGB), and it is split by City limits, with approximately 9.5 acres inside City limits and approximately 40.5 acres outside City limits. The proposed map amendment would apply to the northerly 1.2-acre portion of the 9.5 acres within City limits. The 9.5-acre portion of the property inside City limits has a combination of Comprehensive Plan Map designations and zoning designations: Commercial/C-3 on the front (approximately 7.3 acres), Residential/County EF-80 on the rear (approximately 1.2 acres), and a portion of Floodplain/F-P along the east and north boundaries (approximately 1 acre).

The proposed amendment would change the 1.2 acres from Residential/County EF-80 to Commercial/C-3, so all of the non-floodplain portion inside City limits would then be Commercial/C-3.

The unincorporated portion of the property within the UGB and outside City limits is approximately 40.5 acres. It is within the Floodplain Comprehensive Plan Map designation. It has County EF-80 zoning, with the entirety also being within the County's Floodplain Overlay Districts. The proposal would not change the Comprehensive Plan designation or county zoning of this unincorporated portion of the parcel.

Location: The subject site is located at 3225 NE Highway 99 West, more specifically described at Tax Lot 1500, Section 10, T.4S., R 4 W., W.M.

Applicant: Cascade Steel Rolling Mills, c/o Jennifer Hudson representing property owner White Top Properties LLC

5. **Commissioner/Committee Member Comments**

6. **Staff Comments**

7. **Adjournment**

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EXHIBIT 1 - MINUTES

April 1, 2021 **6:30 pm**
Planning Commission **Zoom Online Meeting**
Work Session Meeting **McMinnville, Oregon**

Members Present:	Roger Hall, Robert Banagay, Sylla McClellan, Brian Randall, Lori Schanche, Beth Rankin, Dan Tucholsky, and Sidonie Winfield
Members Absent:	Gary Landenwalter and Ethan Downs – Youth Liaison
Staff Present:	Heather Richards – Planning Director, Chuck Darnell – Senior Planner, and Tom Schauer – Senior Planner

1. **Call to Order**

   Chair Hall called the meeting to order at 6:30 p.m.

2. **Approval of Minutes**

   - **November 19, 2020**
   - **February 18, 2021**

   Commissioner McClellan moved to approve the November 19, 2020 and February 18, 2021 minutes. The motion was seconded by Commissioner Rankin and passed 8-0.

3. **Citizen Comments**

   None

4. **Work Session:**

   - **HB 2001 Rule Making / McMinnville Residential Site and Design Review Standard Package**

   Senior Planner Darnell gave a presentation on HB 2001 and residential code update. The Planning Department worked with a consultant on draft development and design standards for housing types. The standards were reviewed by the Commission in 2020. The document included tiny houses, cottage clusters, plexes, townhouses, single dwellings, ADUs, and apartments. The structure of the document was that each housing type had a basic development standards table to address lot dimensions, lot sizes, setbacks, building height, and parking as well as standards for three scenarios: with/without alley and infill. Each housing type would be subject to the applicable universal design standards. The universal design standards addressed street frontage, front yard, alleys, parking, common open space, private open space, compatibility, façade, and subdivisions. HB 2001 required cities of certain sizes to allow middle housing in areas and properties that

allowed for the development of detached single family dwellings. The focus was on housing choice or housing options. DLCD adopted a model code in December 2020. If a city did not implement their own code/plan amendments prior to the deadline of June 2022, the model code applied directly. He discussed the current scope of work for updates to the draft and zoning districts. He asked if the Planning Commission was interested in pursuing the percentage-of-lots approach. Staff thought that type of program would be difficult to manage over time. A more consistent application of middle housing types throughout the entire city would better align with the Great Neighborhood Principles intent.

There was consensus to allow middle housing types across the board in all residential zones.

Senior Planner Darnell asked if the Commission was interested in pursuing a new residential zone where middle housing types would be allowed with more flexibility in the development standards. Staff recommended considering a flexible residential zone, but also right-size development standards for McMinnville.

There was discussion regarding possible development standards that could be added.

Senior Planner Darnell discussed infill vs. new development and lots greater than 10,000 and 14,000 square feet in the City. He asked if the Commission was supportive of establishing thresholds for infill vs. new development based on lot size. Staff recommended establishing a threshold at 14,000 square feet and all infill development should match the base zoning on the interior and perimeter.

There was discussion regarding looking at adjacent sites to new development and whether they were incompatible or had a negative impact to existing neighborhoods, what the threshold size should be, current minimum lot sizes, options for the flex zone, and Planned Development criteria.

Senior Planner Darnell discussed design standards. He asked if the Commission was interested in applying design standards to middle housing types. Staff recommended applying the universal design standards to all housing types.

There was support for staff's recommendation.

Senior Planner Darnell explained the off-street parking standards. He asked if the Commission was interested in considering any on-street parking allowances. Did the parking requirements based on lot size have any impact on the Commission's consideration of the potential smaller lot sizes in the new development standards? Staff recommended considering new development standards, but right-size them for McMinnville's off-street parking needs.

There was discussion regarding off street parking based on lot size or unit, stacking in the driveway, concern about on street parking and not enough space for fire and garbage trucks, concern about equity, visitor parking, how they could not mandate more than one parking space per unit with HB 2001, Planned Unit Development parking standards, lack of parking affecting quality of life, lack of transit in McMinnville, use of parking lots at night, adding a lot coverage standard for green space on lots, and whether the HB 2001 rules applied to Planned Developments for parking standards.

There was consensus to not consider any on-street parking allowances and concern about potential small lot sizes for missing middle development that would allow only one or two off-street parking spaces, such as only two parking spaces for a quadplex.

Senior Planner Darnell then discussed lot sizes for middle housing types, lot sizes in current zones, options for lot sizes, and existing lots under 5,000 square feet, 5,000 to 6,999 square feet, and lots larger than 7,000 square feet. He asked what approach the Commission would like to follow: strict compliance with the OARs by following existing zoning district minimum lot sizes for all middle housing types (besides townhouses), allowing middle housing types (besides townhouses) on lots smaller than 5,000 or 7,000 square feet, or limiting quadplexes and cottage clusters in the R-3 and R-4 zones to lots of at least 7,000 square feet.

There Commission was comfortable allowing middle housing types on lots smaller than 5,000 or 7,000 square feet only if they were following the Planned Development process. There was support for larger lots to accommodate more parking, getting visuals of potential scenarios that could be created on these lots, and driving by current examples in the City.

Senior Planner Darnell explained the number of units per lot per the OARs. He asked if the Commission was interested in allowing more units per parcel (either through extra dwellings or ADUs) than was strictly required by the OARs. Staff recommended not allowing additional units.

There was consensus to not allow additional units.

Senior Planner Darnell asked if the Commission was interested in allowing middle housing types (besides townhouses) to be detached in any configuration. Staff recommended allowing detached units in any configuration as long as the base development and design standards were achieved.

There was support for staff's recommendation, but concern about developers using that to create cottage clusters that did not follow the cottage cluster standards.

Senior Planner Darnell discussed the development standards by housing type. He asked if the Commission was interested in keeping the universal design standards format. Staff recommended updating individual universal design standards to be more specific and meet OAR requirements.

There was support for staff's recommendation.

Senior Planner Darnell discussed other considerations for the O-R (Office-Residential) zone and NE Gateway Planned Development Overlay. He asked if the Commission was interested in having the standards for these housing types the same in the O-R zone. Staff recommended using consistent standards in the O-R zone. Some updates would be necessary to permitted uses in the NE Gateway ordinance to be consistent with HB 2001.

There was discussion regarding the current uses in the O-R zone and NE Gateway District and how universal design standards worked with conversions.

Senior Planner Darnell said there would be public forums in April on these topics. The consultant would use the Planning Commission and public feedback to make amendments to the draft code in a hearing ready format to be completed by the end of May 2021. At the June 2021 Planning Commission meeting, staff would provide an update on the code amendment work. Final adoption needed to occur by June 30, 2022.

- **SRO Review**

Senior Planner Schauer discussed the proposed amendments to the Zoning Ordinance to allow and regulate Single Room Occupancy (SRO) development as a housing type in McMinnville. The intent was that this housing type would be part of the bundle of code amendments related to middle housing development and residential development and design

standards, although this housing type was not required by HB 2001. The draft code language was recommended by the Affordable Housing Committee. Single Room Occupancy housing developments were not currently permitted. SRO housing developments allowed for one or more common facilities to be shared by some or all units, rather than every unit having all of those facilities. Many ordinances, including McMinnville's, defined dwelling units in a way that limited the number of unrelated people that may occupy a dwelling, typically no more five unrelated persons. SROs could offer greater affordability by reducing the amount of area within a building that was otherwise devoted to separate individual kitchen and/or sanitation facilities, as well as the associated construction, plumbing, and dedicated electrical costs. It also allowed for a social housing model that was desired by some people and the size of an SRO development and number and ratio of common/shared facilities could be scaled to meet different needs that allowed occupancy by a greater number of unrelated persons. He explained the key provisions for small and large SRO housing developments and the applicable zones where they would be allowed as well as the proposed standards. He then showed examples of these types of units.

There was discussion regarding the difference between subleasing rooms in a house or apartment and SROs, differentiating between VRBOs and SROs, and where SROs would be located.

5. Commissioner Comments

None

6. Staff Comments

Planning Director Richards explained the City was going into a furlough program and how that would affect the Planning Department's work.

7. Adjournment

Chair Hall adjourned the meeting at 9:52 p.m.

Heather Richards
Secretary

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EXHIBIT 2 - MINUTES

January 20, 2022 **6:30 pm**
Planning Commission **Zoom Online Meeting**
Regular Meeting **McMinnville, Oregon**

Members Present: Robert Banagay, Lori Schanche, Gary Langenwalter, Brian Randall, Beth Rankin, Dan Tucholsky, Sidonie Winfield, Matt Deppe, and Sylla McClellanE

Members Absent:

Staff Present: Heather Richards – Planning Director, Tom Schauer – Senior Planner, and Amanda Guile-Hinman – City Attorney

1. **Call to Order**

   Vice Chair Schanche called the meeting to order at 6:30 p.m.

2. **Swear In New Members**

   City Attorney Guile-Hinman swore in new Planning Commissioner Matt Deppe.

3. **Election of Chair and Vice-Chair**

   Commissioner Banagay nominated Lori Schanche for chair. Commissioner Schanche declined.

   Commissioner Langenwalter nominated Sidonie Winfield for chair. The nomination passed unanimously.

   Commissioner Tucholsky nominated Gary Langenwalter for vice chair.

   Commissioner Langenwalter nominated Robert Banagay for vice chair.

   The majority voted for Commissioner Langewalter for vice chair.

4. **Citizen Comments**

   None

5. **Minutes**

   - **January 21, 2021**

- **November 18, 2021**

Commissioner Langenwalter noted in the November 18 minutes that his and Commissioner Rankin's names were misspelled.

Commissioner Langenwalter moved to amend the November 18, 2021 minutes. The motion was seconded by Commissioner McClellan and passed 9-0.

Commissioner Banagay moved to approve the January 21 and November 18, 2021 minutes as amended. The motion was seconded by Commissioner Tucholsky and passed 9-0.

6. Public Hearing:

A. Quasi-Judicial Hearing: Short Term Rental (STR 6-21)

(Continued from December 16, 2021, PC Meeting)

Request: Approval to allow for the operation of a short term rental establishment within an existing residence.

Location: The subject site is located at 713 NW Cedar Street and is more specifically described as Tax Lot 10800, Section 20AA, T.4 S., R. 4 W., W.M.

Applicant: Kari Mamizuka

Disclosures: Chair Winfield recused herself from the hearing because she lived in this neighborhood.

Vice Chair Langenwalter opened the public hearing and asked if there was any objection to the jurisdiction of the Commission to hear this matter. There was none. He asked if any Commissioner wished to make a disclosure or abstain from participating or voting on this application.

Commissioner Deppe would be abstaining because he had not been on the Commission for the previous hearing. Commissioner McClellan disclosed that she owned a vacation rental in another state, but felt comfortable participating.

Vice Chair Langenwalter asked if any Commissioner needed to declare any contact prior to the hearing with the applicant or any party involved in the hearing or any other source of information outside of staff regarding the subject of this hearing.

Commissioner Tucholsky said on December 30 and January 5 he had email conversations with Mr. Sykes about procedures and best practices and Commissioner Tucholsky had directed him to staff.

Vice Chair Langenewalter asked if any Commissioner had visited the site. If so, did they wish to discuss the visit to the site? Several Commissioners had visited the site, but had no comments to make on the visit.

Staff Report: Senior Planner Schauer presented the request for a short term rental on NW Cedar Street. The hearing had been continued from December 16, 2021. He described the subject site and procedural requirements. At the December 16 hearing, staff recommended approval with conditions.

The public testimony received on this application asserted that the Planning Commission must deny the application, alleging that the approval would violate other local, state, and federal law and/or policies discussed in the background section of the staff report. This assertion was that the Planning Commission must, as part of their decision, treat laws other than the applicable standards specified in the Zoning Ordinance as land use standards for short term rentals. The testimony did not cite any applicable provision of the cited federal, state, or local laws/policies with which the proposal would not comply and did not identify how the proposal would not comply with any provisions of those laws. It also did not indicate what would be required for the proposal to comply with any provisions of the cited laws. There was no evidence in the record referencing any provision of those laws with which the proposed use wouldn't comply, and none identifying how the proposal would not comply with any applicable provisions of those laws. There was no evidence in the record identifying what would be required for the proposal to comply with those laws and no evidence citing any provisions of state or local laws which would conflict with and be pre-empted by federal law. In general, there were provisions of federal, state, and local law with which private entities must comply which did not constitute standards as part of a land use application review for permitted uses. The question of whether other laws not listed as standards should be applied as approval standards for this land use decision was a matter of legal interpretation rather than policy interpretation. Guidance on this issue was provided by the City Attorney. Staff found that the proposed use was a permitted use and with conditions, the proposal complied with the applicable standards specified in the Zoning Ordinance for the proposed use. Staff recommended approval with conditions and supplemental findings in the decision document. He then reviewed the supplemental findings.

Commissioner Randall asked how neighbors could contact the owner or property manager after hours if there was a noise issue. Planning Director Richards said they would call the non-emergency police number.

Commissioner Banagay asked what had been the experience with short term rentals as far as violations. Planning Director Richards said there was an annual renewal of the permit, so if there were too many violations, they could revoke the permit. Violations did not happen very often.

Applicant: Michael Devlin, representing the applicant, noted the application met all of the requirements.

Public Testimony:

Proponents: None

Opponents: William Sykes, McMinnville resident, said as a neighbor, he was concerned about the quality of life and economic health for the community. He did not think the application was compliant with federal accessibility laws. Also the submitted application was inaccurate and thus incomplete. He listed several City, state, and federal laws that were not being followed regarding accessibility. He thought both the applicant and City would be liable should future ADA discriminations be brought forward if this application was approved. Also the neighborhood meeting was not accessible.

Ted Cutler, McMinnville resident, thought the Commission should deny the application due to the non-compliance to ADA and neighborhood meeting requirements. Some options moving forward were to hire an expert agency to provide a site survey per ADA guidelines for accessibility issues. They could also develop a barrier removal plan. This process could be incorporated into the application criteria.

Dallas Pederson, McMinnville resident, was disappointed that the testimony was limited to three minutes.

Rebuttal: Mr. Devlin said the testimony was not relevant to the situation at hand. The application met all of the criteria.

Vice Chair Langenwalter closed the public hearing. There was discussion regarding whether or not to keep the record open for additional written testimony.

Commissioner Randall said the ADA issue was more of a building official/City process, not something the Planning Commission looked at as a land use standard.

The majority of the Commission did not want to keep the record open.

Based on the findings of fact, conclusionary findings for approval, materials submitted by the applicant, and evidence in the record, Commissioner Schanche MOVED to APPROVE STR 6-21 with conditions and supplemental findings. SECONDED by Commissioner Rankin.

Commissioner Randall moved to amend the motion to add a condition that the applicant provide neighbors within a 300 foot radius with an after-hours phone number. The amendment died for lack of a second.

Commissioner Schanche said the ADA regulations were for public facilities and a private home was not rated or sued for ADA.

City Attorney Guile-Hinman said the distinction here was that although the ADA might apply, it was imputed on the owner of the property and not part of the land use decision. Staff did not see any evidence of any violation of ADA.

The motion PASSED 7-0-2 with Commissioners Winfield and Deppe recused.

There was discussion regarding making amendments to the STR code in the future.

B. Legislative Hearing: Proposed Comprehensive Plan Amendments (G 7-21)

(Continued from December 16, 2021, PC Meeting)

Request: This is a legislative action initiated by the City of McMinnville to amend the McMinnville Comprehensive Plan by adopting the Three Mile Lane Area Plan as a supplemental document and to amend the Comprehensive Plan, Volume II, Chapter VI, Transportation System, to add a proposal to amend the Comprehensive Plan Map and Transportation System Plan consistent with the Three Mile Lane Area Plan.

Applicant: City of McMinnville

Disclosures: Chair Winfield opened the public hearing and asked if there was any objection to the jurisdiction of the Commission to hear this matter. There was none. She asked if any Commissioner wished to make a disclosure or abstain from participating or voting on this application.

Commissioner Langenwalter received two unsolicited emails from Friends of Yamhill County. He glanced at them and when he realized they were already in the packet, he did not read

further. Chair Winfield said she saw something on social media from Friends of Yamhill County and it was already in the packet.

Chair Winfield asked if any Commissioner had visited the site. Several Commissioners had visited the site, but had no comments to make on the visit.

Staff Report: Planning Director Richards said this was a request to adopt the Three Mile Lane Area Plan and appendices as a supplemental document to the Comprehensive Plan and amend Volume II of the Comprehensive Plan, Goals, Policies and Proposals, Chapter VI (Transportation) to add a proposal to amend the Comprehensive Plan Map and Transportation System Plan consistent with the adopted Three Mile Lane Area Plan. She explained what an area plan was. Last week there was a "call to action" sent out which created a lot of angst. She planned to walk through the plan and give highlights and some specificity to respond to the testimony and dispel some of the misinformation. She then discussed the study area along with major property owners and zoning designations and the land use plan and transportation plan for the area. She explained the project goals and common elements such as transportation, urban design, and parks and trails. There had been a robust public engagement process and she discussed the public input that was received as well as work with the Project Advisory Committee and property owners. She reviewed the economic analysis that was done. There was a residential demand in this area and significant opportunities in general merchandise and dining/drinking businesses. This area was a food desert and there was a demand for tourism and office space. Three land use concepts were developed and a preferred alternative was chosen. The key features were walkable commercial center, innovation campus, and mixed use neighborhoods. She discussed the recommended Comprehensive Plan Map amendments.

Planning Director Richards explained the reasons for the commercial rezone on the south side of Highway 18, especially in land use efficiency and meeting the commercial land need. She explained the concerns from Friends of Yamhill County and 1,000 Friends of Oregon. She described the proposed design and development standards for the mixed use town centers, key urban design elements, and how it would bring family wage jobs. She clarified Highway 18 was still a bypass and met the mobility standards of a state expressway and freight route. She reviewed the transportation plan for the area with signals and roundabout, intersection traffic operations, transportation analysis, vehicle performance, concept phasing and costs, relationship between access and mobility, state standards for expressways, management of Highway 18 and improvements, and vehicle system safety. The next step was to adopt a regulatory framework through the Zoning Ordinance and Planned Development Overlay. She then reviewed the public testimony that had been received.

Questions for Staff: Commissioner Rankin asked if the need was demonstrated, could they improve the flow of traffic before the 20 year expected timeframe. Planning Director Richards said it was a 20 year planning horizon and as projects came in, applicants would do a traffic impact analysis and if needed, transportation improvements to mitigate the impact.

Commissioner Schanche asked about the future overpass. Planning Director Richards thought the overpass would be the interchange on Highway 18 and Cumulus for vehicles.

Commissioner Schanche thought they should retain the grade separated crossing for pedestrians/bicyclists. Planning Director Richards said there would be signalized intersections that could serve that purpose.

Commissioner Langenwalter asked about dropping Highway 18 below grade level. Planning Director Richards said that was the proposed rehab for the existing interchange at Three Mile Lane and Highway 18. It would take time to get funding for the project.

Commissioner Tucholsky asked what the alternatives were to dropping Highway 18 due to the cost. Planning Director Richards could bring back the consultant to discuss the alternatives.

Public Testimony:

Proponents: None

Opponents: Sid Friedman, Friends of Yamhill County, supported most of the elements in the plan, but opposed the regional retail shopping center because of traffic, wages, impacts to other business districts, and pressure for additional rezone applications to commercial. Highway 18 was an expressway with limited local access. The proposed retail uses would generate up to 33 times more traffic than industrial uses. A new retail center would harm existing retailers. Wages in retail and dining were by far lower than any other job sector in McMinnville. Housing costs were just a piece of housing affordability, it was also wages. He asked the Commission to consider the recommendations in their written testimony.

Mark Davis, McMinnville resident, discussed the daily average traffic counts for Highway 18. Retail would increase the amount of traffic. There were no bike and pedestrian amenities and everyone going to this area would have to do it by vehicle. The only housing was high density, which did not meet the Great Neighborhood Principles.

Commissioner Langenwalter thought the bus system would expand to that area. Mr. Davis said more service would be great, but it was not as reliable as a personal automobile or bicycle.

Steve Iversen, McMinnville resident, said there was no commitment to pedestrian overpasses in the plan. Traffic would be a huge problem and access would only be by cars.

Rebecca Hillyer, Chemeketa Community College, said the college was concerned about the proposed jughandle that would cut through their campus coming off of Cumulus. They objected to having Cumulus go behind the campus as it put a road close to a classroom building and medical center.

Ilsa Perse, McMinnville business owner, owned a business on 3rd. She thought the retail center would conflict with the retail on 3rd Street. People would still have to go places to get what they needed and the affordable housing would be separated from the rest of City and would not follow the Great Neighborhood Principles.

Planning Director Richards recommended continuing the hearing for staff to bring back additional information. Regarding housing, she agreed that as it currently was planned, it was not a good situation. The Three Mile Lane Area Plan included open space, trail connectivity, and ways to make it a great neighborhood. There were some downtown business owners on the Project Advisory Committee and the impact to businesses was an active discussion in that group and in the public meetings. Retail in the downtown did not serve the whole community and there needed to be more discussion about getting people off of Highway 18 to downtown.

Commissioner Langenwalter MOVED to CONTINUE the hearing for G 7-21 to February 17, 2022. The motion was seconded by Commissioner Tucholsky and PASSED 9-0.

The Commission discussed what additional information staff should bring back to the next hearing.

C. <u>Quasi-Judicial Hearing: Comprehensive Plan Map Amendment (CPA 2-20) and Zone Change, including Planned Development Overlay Designation (ZC 3-20)</u>

(Continued from December 16, 2021, PC Meeting)

Request: Approval to amend the Comprehensive Plan Map from Industrial to Commercial, and an amendment to the Zoning Map from M-2 (General Industrial) to C-3 PD (General Commercial with a Planned Development Overlay), for approximately 37.7 acres of a 90.4-acre property.

The 37.7 acres includes 4.25 acres intended for right-of-way dedication for a future frontage road. The application also shows a portion of the area subject to the map amendment intended for a north-south extension of Cumulus Avenue and future east-west street connectivity.

The request is submitted per the Planned Development provisions in Section 17.51.010(B) of the Zoning Ordinance, which allows for a planned development overlay designation to be applied to property without a development plan; however, if approved, no development of any kind can occur on the portion of the property subject to the C-3 PD overlay until a final development plan has been submitted and approved in accordance with the Planned Development provisions of the Zoning Ordinance. This requires the application for the final development plan to be subject to the public hearing requirements again at such time as the final development plans are submitted.

Location: The subject site is located at 3310 SE Three Mile Lane, more specifically described at Tax Lot 700, Section 26, T.4S., R 4 W., W.M.

Application: Kimco McMinnville LLC, c/o Michael Strahs

Disclosures: Chair Winfield opened the public hearing and asked if there was any objection to the jurisdiction of the Commission to hear this matter. There was none. She asked if any Commissioner wished to make a disclosure or abstain from participating or voting on this application. There was none.

Commissioner Tucholsky MOVED to CONTINUE the hearing for CPA 2-20/ZC 3-20 to February 17, 2022. The motion was seconded by Commissioner McClellan and PASSED 9-0.

7. Discussion Item

- **Planning Commission Work Plan**

Planning Director Richards suggested postponing this discussion to a future meeting.

There was discussion regarding the time limit for verbal public comments and the deadline for written comments to be turned in.

There was consensus to hold a Work Session at 5:30 p.m. on February 17 to discuss the Planning Commission Work Plan.

8. Commissioner Comments

None

9. Staff Comments

Planning Director Richards discussed upcoming agenda items and staff recruitment.

10. Adjournment

Chair Winfield adjourned the meeting at 10:19 p.m.

Heather Richards
Secretary

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EXHIBIT 3 - MINUTES

February 17, 2022 **5:30 pm**
Planning Commission **Zoom Online Meeting**
Work Session Meeting **McMinnville, Oregon**

Members Present: Robert Banagay, Lori Schanche, Gary Langenwalter, Brian Randall, Beth Rankin, Dan Tucholsky, Sidonie Winfield, Matt Deppe, and Sylla McClellan

Members Absent:

Staff Present: Heather Richards – Planning Director, Tom Schauer – Senior Planner, Monica Bilodeau – Senior Planner, and Amanda Guile-Hinman – City Attorney

WORK SESSION

Chair Winfield called the Work Session to order at 5:30 p.m.

- **Planning Commission Agreement**
- **Planning Commission Work Plan**

Planning Director Richards discussed items on the Work Plan including the long range plans, Comp Plan amendments, and Zoning Ordinance amendments as well as funding for the projects. Other items requested by the Planning Commission including parking lot, proprietary rental buying in neighborhoods, and short term rentals.

Commissioner Rankin reviewed her research on proprietary rental buying. She was still researching to find out if there really was a problem and if there was something they could do about it.

Commissioner McClellan was looking into properties that were vacation rentals but did not have a City permit and other cities' policies regarding short term rentals.

There was discussion regarding impacts of short term rentals to neighborhoods, current spacing standard, affordable housing, staff time, and putting in a moratorium.

There was consensus for staff to bring back a recommendation regarding a moratorium timeline and background on the current process for short term rentals.

There was discussion regarding upcoming agenda items and possibly meeting twice per month to get through the workload and changing the deadline for written public testimony.

There was consensus for staff to bring back a recommendation for a deadline that met state law.

Planning Director Richards discussed the neighborhood meeting requirement and how these meetings sometimes became hostile.

The Commission thought it was a valuable communication tool with the neighborhood. Commissioner Randall recommended sign postings at the sites.

Chair Winfield adjourned the Work Session at 6:28 p.m.

1. Call to Order

Chair Winfield called the meeting to order at 6:30 p.m.

2. Citizen Comments

None

3. Minutes

- **December 16, 2021**

Chair Winfield said she had to leave the December meeting early, which was not noted in the minutes.

Commissioner Langenwalter moved to approve the December 16, 2021 minutes as amended. The motion was seconded by Commissioner Schanche and passed 9-0.

4. Public Hearing:

A. Legislative Hearing: Proposed Comprehensive Plan Amendments (G 7-21)

(Continued from January 20, 2022, PC Meeting)

Request: This is a legislative action initiated by the City of McMinnville to amend the McMinnville Comprehensive Plan by adopting the Three Mile Lane Area Plan as a supplemental document and to amend the Comprehensive Plan, Volume II, Chapter VI, Transportation System, to add a proposal to amend the Comprehensive Plan Map and Transportation System Plan consistent with the Three Mile Lane Area Plan.

Applicant: City of McMinnville

Disclosures: Chair Winfield opened the public hearing and asked if any Commissioner wished to make a disclosure or abstain from participating or voting on this application. There was none.

Staff Presentation: Planning Director Richards gave a background on the Three Mile Lane Area Plan including the study area, project goals, public input, land use plan, and transportation plan. She then addressed credibility and accountability, planning staff's role, desire for commercial from the community, Friends of Yamhill County's testimony on retail leakage, Comprehensive Plan Map amendments, plan elements and overlay requirements, south side housing opportunities, and public testimony received since the last hearing on January 20.

Naomi Zwerdling, ODOT Planning and Development Review Manager, said ODOT had reviewed the technical aspects of the project. They supported the plan and would help to successfully implement it.

Michael Duncan, ODOT Senior Region Planner, explained the funding availability for implementation of the plan, how mobility targets were established and how the plan met the targets, models used and methodologies they were based on, how Highway 18 would retain its current classification as an expressway, how Highway 18 was access controlled, and how the plan would not change the speed limit.

Andrew Mortensen, Senior Transportation Planner with David Evans and Associates, discussed the preferred facility design for the area including grade changes, connectivity to downtown, pedestrian/bicycle amenities, and options for local street circulation.

Questions for Staff: Commissioner Langenwalter supported a pedestrian/bicycle overpass over Highway 18 at Norton Lane and Cumulus Avenue. He asked why they were not included in the design. Planning Director Richards said that was discussed, however funding and the highway width were issues. Mr. Mortensen did not think it was reasonable to assume they would get the state funding for all the interchanges at once in this 20 year planning horizon.

Commissioner Schanche thought it should be included in the plan in case there was funding in the future.

Commissioner Langenwalter thought without a bridge, more people would use their cars instead. He also wanted to leave the bridges in the plan at both Norton and Cumulus.

Mr. Mortensen discussed Option 1 for the facility design interchanges and staging of these bridges. It became a question of when to make the investment and what the ultimate design configuration would be.

Planning Director Richards suggested amending the plan to add the bridges in the Future Considerations section.

Commissioner Tucholsky suggested a ped/bike tunnel instead of a bridge. Mr. Mortensen said safety was an issue for tunnels.

Commission Schanche thought they should add a note that more detailed design would occur for the jughandle and Chemeketa College.

Commissioner Banagay asked how they could ensure they had the land in the future to build the bridges. Could they require developers to dedicate the land? Planning Director Richards said if they could not show a basis for it, they could not require the dedication.

Josh Anderson, David Evans and Associates, said there was an option that upon development they could require additional setbacks to accommodate a potential future ped/bike facility.

Commissioner Langenwalter asked about local traffic to the new retail area as opposed to destination traffic. Planning Director Richards said the data showed that people were

leaving McMinnville to shop at various shopping destinations. If the retail was here, that money would be spent here.

Public Testimony:

Proponents: None

Opponents: Sid Friedman, Friends of Yamhill County, said McMinnville already had a human-scaled, pedestrian-friendly town center on 3rd Street and it did not need another across an expressway from the rest of town. He compared the commercial developments in Bend and Hillsboro with McMinnville's proposed regional shopping center. He thought the commercial uses in this area should be neighborhood-scaled and neighborhood-serving. McMinnville had a commercial land surplus of at least 31 acres with the recent UGB expansion. He explained the Friends' recommendations.

Mark Davis, McMinnville resident, thought the reports were technically correct. However, they should look at the numbers for the volume to capacity ratio for Cumulus which he thought were in error. The roundabout would change the speed limit on Highway 18. The volume to capacity ratios did not speak to drivers' personal experiences, which was how the public perceived it and adding more lights would slow traffic even more. He did not think the plan met all of the Great Neighborhood Principles. There was no safe way for pedestrians/bicyclists to cross Highway 18. He thought they should keep the existing industrial designations and try to find an employer that would provide good paying jobs.

Steve Iversen, McMinnville resident, said the land use plan gave the impression that they were also approving the zoning. The transportation plan did not include the pedestrian crossings, which he thought were essential. He did not think pedestrians and bicyclists would use the connection to downtown. Instead of using the funding for the interchange reconfiguration at Three Mile Lane and Highway 18, the funding should go to the Norton Lane interchange.

Jim Croytsbender, McMinnville resident, discussed current speeding and traffic accidents on Highway 18. He was also concerned about people getting on the frontage roads before the new bridge was built. He thought the bridge should be built first before any development. He was concerned about national chains putting local businesses out of business. Retail jobs would not pay enough for people to live here, but industrial jobs would. He did not think they should rezone for more commercial.

Margaret Cross, McMinnville resident, addressed the process and how community engagement suffered due to Covid. The public was not aware of the plan and needed more time to review and comment on it. She thought the public involvement process needed to be started over.

Ilsa Perse, McMinnville business owner, said there was a lot of controversy over the kind of retail that a development like this would attract. If the land was rezoned to commercial, they needed to look at innovative solutions for the neighborhood they wanted to create there. The descriptions in the plan were vague and would not require developers to do what the community wanted.

Cheryl Lambright, McMinnville resident, thought they needed to slow the process down and make thoughtful plans. She agreed with what had been stated by the other commenters.

Rebuttal: Planner Director Richards said part of the efficiency standards for the recent UGB amendment was to rezone 40 acres of industrial land to commercial land in this area. There were concerns about the design of the commercial development. There was discussion

regarding sustainable design, but it did not make it into the goals or document. However, it could be included. Regarding adding traffic to Highway 18, there was a lot of vacant land in the City limits in this area that would be developed. What they were talking about was how it would be developed and serve the community. If they wanted more community process, she would have to get additional resources through the City Council. They were going to be adding trips to Highway 18, but they were also going to improve the functionality of the highway by removing local access points. Housing was an issue in McMinnville. This type of master planning was what would put the foundation on the ground for how they wanted to see things move forward.

Mr. Duncan clarified the volume to capacity ratio on Norton and Cumulus, which were below the mobility targets.

Mr. Mortensen discussed the traffic safety analysis that was done and safety solutions proposed. The frontage road improvements could still be done regardless of the reconstruction of the interchange at Three Mile Lane. They would need to be a part of future development to ensure connectivity.

Planning Director Richards explained they had looked at the examples from other cities to see how they could bring the need for additional commercial in a way that was not generic and was an asset to McMinnville. She listed the possible uses for the commercial, which did allow multi-family housing as well as office and retail space. They were hesitant to put in housing due to the proximity of the airport. That was the reason the housing was focused further west.

Commissioner Langenwalter did not think they wanted 40 acres of shopping center. Planning Director Richards said it was not meant to create the big pad, big box situation. It should be unique architecturally and something that represented McMinnville. Some of the testimony was the implementing language did not go far enough to clarify that in the standards. They could work to make it clearer.

Commissioner McClellan thought clearer design standards should be a future discussion.

Commissioner Schanche asked about setting a maximum square footage. Planning Director Richards said the large format commercial standards applied to all commercial development for a certain size regardless of where it was located. It limited the overall impact of the size of a building and broke it up. It did not limit the interior layout in terms of space devoted to one tenant. She did not want to set the standards so high that something could not be developed even if it met the value system for McMinnville.

Commissioner Randall suggested setting up a block pattern for each block that would not allow a big box retailer.

Commissioner Tucholsky clarified by adopting the plan, they were not giving up the opportunity to adopt design standards. Those would be done at a later date. Planning Director Richards said that was correct.

Commissioner Tucholsky MOVED to CLOSE the public hearing, SECONDED by Commissioner Langenwalter. The motion PASSED 9-0.

Chair Winfield closed the public hearing.

Commission Deliberation: Commissioner McClellan suggested staff bring back amended language in the plan that strengthened the need for unique design and development standards.

Commissioner Langenwalter asked for amended language regarding the bike/ped bridges.

Commissioner Schanche MOVED to CONTINUE G 7-21 to the March 17, 2022 meeting with direction to staff to bring back amended language to address the bike/ped bridges and design standards. SECONDED by Commissioner Rankin. The motion PASSED 9-0.

B. Quasi-Judicial Hearing: Comprehensive Plan Map Amendment (CPA 2-20) and Zone Change, including Planned Development Overlay Designation (ZC 3-20)

(Continued from January 20, 2022, PC Meeting)

Applicant has requested a continuance to March 17, 2022

Request: Approval to amend the Comprehensive Plan Map from Industrial to Commercial, and an amendment to the Zoning Map from M-2 (General Industrial) to C-3 PD (General Commercial with a Planned Development Overlay), for approximately 37.7 acres of a 90.4-acre property.

The 37.7 acres includes 4.25 acres intended for right-of-way dedication for a future frontage road. The application also shows a portion of the area subject to the map amendment intended for a north-south extension of Cumulus Avenue and future east-west street connectivity.

The request is submitted per the Planned Development provisions in Section 17.51.010(B) of the Zoning Ordinance, which allows for a planned development overlay designation to be applied to property without a development plan; however, if approved, no development of any kind can occur on the portion of the property subject to the C-3 PD overlay until a final development plan has been submitted and approved in accordance with the Planned Development provisions of the Zoning Ordinance. This requires the application for the final development plan to be subject to the public hearing requirements again at such time as the final development plans are submitted.

Location: The subject site is located at 3310 SE Three Mile Lane, more specifically described at Tax Lot 700, Section 26, T.4S., R 4 W., W.M.

Application: Kimco McMinnville LLC, c/o Michael Strahs

Disclosures: Chair Winfield opened the public hearing and asked if there was any objection to the jurisdiction of the Commission to hear this matter. There was none. She asked if any Commissioner wished to make a disclosure or abstain from participating or voting on this application. There was none.

Commissioner Rankin asked why this application was being continued again. Planning Director Richards said they had paused for the other two property owners to put together proposals based on the Planning Commission's request. They also had to do a more in depth transportation analysis and the ODOT personnel for the review had taken some time off.

Commissioner Langenwalter MOVED to CONTINUE the hearing for CPA 2-20/ZC 3-20 to March 17, 2022. The motion was seconded by Commissioner McClellan and PASSED 9-0.

C. Quasi-Judicial Hearing: Comprehensive Plan Map Amendment (CPA 1-21) and Zone Change, including Planned Development Overlay Designation (ZC 2-21)

Applicant has requested a continuance to March 17, 2022

Request: Approval to amend the Comprehensive Plan Map from Industrial to Commercial, and an amendment to the Zoning Map from M-2 (General Industrial) to C-3 PD (General Commercial with a Planned Development Overlay), for a property of approximately 8 acres.

The request is submitted per the Planned Development provisions in Section 17.51.010(B) of the Zoning Ordinance, which allows for a planned development overlay designation to be applied to property without a development plan; however, if approved, no development of any kind can occur on the portion of the property subject to the C-3 PD overlay until a final development plan has been submitted and approved in accordance with the Planned Development provisions of the Zoning Ordinance. This requires the application for the final development plan to be subject to the public hearing requirements again at such time as the final development plans are submitted.

Location: The subject site is located at 3330 SE Three Mile Lane, more specifically described at Tax Lot 600, Section 26, T.4S., R 4 W., W.M.

Applicant: Ken Sandblast, Westlake Consultants, Inc. representing property owner 3330 TML, c/o Bryan Hays

Disclosures: Chair Winfield opened the public hearing and asked if there was any objection to the jurisdiction of the Commission to hear this matter. There was none. She asked if any Commissioner wished to make a disclosure or abstain from participating or voting on this application. There was none.

Commissioner Tucholsky MOVED to CONTINUE the hearing for CPA 1-21/ZC 2-21 to March 17, 2022. The motion was seconded by Commissioner McClellan and PASSED 9-0.

D. <u>Quasi-Judicial Hearing: Comprehensive Plan Map Amendment (CPA 2-21) and Zone Change, including Planned Development Overlay Designation (ZC 3-21)</u>

Applicant has requested a continuance to March 17, 2022

Request: Approval to amend the Comprehensive Plan Map from Industrial to Commercial, and an amendment to the Zoning Map from M-L (Limited Light Industrial) to C-3 PD (General Commercial with a Planned Development Overlay), for approximately 21.1 acres of an 89.9-acre property, plus an additional 1.5 acres of the 89.9-acre property proposed to be dedicated for right-of-way at the time of development.

The request is submitted per the Planned Development provisions in Section 17.51.010(B) of the Zoning Ordinance, which allows for a planned development overlay designation to be applied to property without a development plan; however, if approved, no development of any kind can occur on the portion of the property subject to the C-3 PD overlay until a final development plan has been submitted and approved in accordance with the Planned Development provisions of the Zoning Ordinance. This requires the application for the final development plan to be subject to the public hearing requirements again at such time as the final development plans are submitted.

Location: The subject site is located at Three Mile Lane and Cumulus Avenue, more specifically described at Tax Lot 100, Section 27, T.4S., R 4 W., W.M.

Applicant: Ken Sandblast, Westlake Consultants, Inc. representing property owner DRS Land, LLC c/o Dan Bansen

Disclosures: Chair Winfield opened the public hearing and asked if there was any objection to the jurisdiction of the Commission to hear this matter. There was none. She asked if any Commissioner wished to make a disclosure or abstain from participating or voting on this application. There was none.

Commissioner Banagay MOVED to CONTINUE the hearing for CPA 2-21/ZC 3-21 to March 17, 2022. The motion was seconded by Commissioner Tucholsky and PASSED 9-0.

E. <u>Quasi-Judicial Hearing: Historical Parking Variance (VR 4-21)</u>

Request The applicant has requested a historical structure parking variance to reduce the existing required number of off-street parking spaces by fifty percent, from twenty-six (26) parking spaces to thirteen (13) parking spaces.

Location: The subject site is located at 425 NE Evans Street; R4421BC02800.

Applicant: David Queener, JADA Ventures, LLC

Disclosures: Chair Winfield opened the public hearing and asked if there was any objection to the jurisdiction of the Commission to hear this matter. There was none. She asked if any Commissioner wished to make a disclosure or abstain from participating or voting on this application. There was none. Chair Winfield asked if any Commissioner needed to declare any contact prior to the hearing with the applicant or any party involved in the hearing or any other source of information outside of staff regarding the subject of this hearing. There was none. Chair Winfield asked if any Commissioner had visited the site. If so, did they wish to discuss the visit to the site. Several members of the Commission had visited the site, but had no comments to make on the visits.

Staff Presentation: Senior Planner Bilodeau said this was a request for a historic structure parking variance to reduce the existing required number of off-street parking spaces by 50%. She described the subject site and gave a brief history of the historic telephone register site. The applicant requested reduction of the parking spaces from 26 to 13. The property was zoned C-3 and the existing space was 5,200 square feet to be used as a taphouse. It required one space per 100 square feet of floor area, which was 52 off street parking spaces. The downtown reduction allowed this number to be reduced in half to 26 spots. She reviewed the criteria for the variance, parking plan, and agency and public comments received. Staff recommended approval with conditions.

Questions for Staff: Commissioner Rankin asked about access to the back parking lot of the adjacent property. Senior Planner Bilodeau said this variance would not change any current access.

Commissioner Langenwalter asked about the previous owner's requirement for office space parking. Senior Planner Bilodeau said office use had a lower standard for parking requirements. They were able to meet the requirements without a variance.

Commissioner Deppe asked if the variance would be allowed for any future use. Senior Planner Bilodeau said the variance would only be for the current application. A new use would need to go through the process.

Commissioner Deppe asked if there was concern about people backing out of the parking spots onto 4th. Senior Planner Bilodeau said Engineering did not have any concerns.

Commissioner Deppe asked if the parking requirements were for the whole building or only the dining area. Senior Planner Bilodeau said the calculations were based on the total square footage.

Applicant: David Queener, business owner, said he was moving his business to this location. He explained his operation of a lunch and dinner restaurant. There was additional parking for customers at the parking garage and on street parking. It was also a walkable area.

Commissioner McClellan asked if he planned to use the parking lot for any outdoor seating. Mr. Queener said he did not have plans to use it for that purpose. He would like to have sidewalk seating.

Commissioner Rankin thought he would be getting a larger volume of customers in this new location, especially for lunch. However, she thought there was enough parking that people could find a place to park.

Commissioner Deppe asked if he had contacted the owner of the parking to the north that would help with circulation and people not backing onto 4th. Mr. Queener was open to reaching out to them.

Public Testimony: None

Chair Winfield closed the public hearing.

The applicant waived the 7 day period for submitting final written arguments in support of the application.

Based on the findings of fact, conclusionary findings for approval, and materials submitted by the applicant, Commissioner Schanche MOVED to APPROVE VR 4-21 with conditions. SECONDED by Commissioner Tucholsky. The motion PASSED 9-0.

5. Commission Comments

None

6. Staff Comments

Planning Director Richards discussed staff recruitment.

7. Adjournment

Chair Winfield adjourned the meeting at 11:20 p.m.

Heather Richards
Secretary

City of McMinnville
Planning Department
231 NE Fifth Street
McMinnville, OR 97128
(503) 434-7311

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EXHIBIT 4 - STAFF REPORT

DATE: May 19, 2022
TO: Planning Commission Members
FROM: Monica Bilodeau, Senior Planner
SUBJECT: Elysian Subdivision ZC 1-22 (Zone Change), PD 1-21 (Planned Development), S 1-21 (Subdivision)

STRATEGIC PRIORITY & GOAL:

HOUSING OPPORTUNITIES (ACROSS THE INCOME SPECTRUM)
Create diverse housing opportunities that support great neighborhoods.

OBJECTIVE/S: Collaborate to improve the financial feasibility of diverse housing development opportunities

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Report in Brief:

Staff is bringing this back to Planning Commission with the requested revisions to the conditions. We also have City Engineering staff in attendance to speak to the engineering review process and review of the stormwater report. We also ask that you re-open the public hearing, to receive any additional testimony. The zoom link provided on the April, 300-foot mailing notice was incorrect, and we would like to ensure all testimony is received.

This proceeding is a quasi-judicial public hearing of the Planning Commission to consider three applications on a 3.79 acre parcel located generally east of Meadows Drive and south of 23rd Street and Fendle Way (R4418 00204).

- ZC 1-22. Zone Change from R-1 to R-3
- PD 1-21 Planned Development Overlay
- S 1-21. Subdivision Tentative Plan for an 18-lot residential subdivision

Therefore, the Planning Commission will make recommendations on all applications to the City Council, and the City Council will make the final decision.

The Planning Commission hearing is conducted in accordance with quasi-judicial hearing procedures, and the application is subject to the 120-day processing timeline. The 120- day deadline is June 25, 2022.

Background:

Attachments:
Attachment A. Decision Document with Attachments

The proposal is an application for Zone Change (ZC 1-22) to rezone the property from R-1 to R-3, Planned Development overlay (PD 1-21), and phased 18-lot subdivision (S 1-21) for the property. The zone change will allow the lot size to be reduced from 9,000 square feet to 6,000 square feet. The planned development overlay would allow for the side setbacks to be reduced from seven and a half feet to five feet, all other setbacks would conform to the R-3 standards.

The subject property is a 3.79 acre parcel located generally east of Meadows Drive and south of 23rd Street and Fendle Way. The proposed subdivision will extend Meadows drive, creating a finished through street, and Fendle Way is proposed to be continued into the subdivision and terminated with a cul-de-sac. There is also a 16,925 SF open space tract along the southern property line which will contain stormwater facility and adjacent will be a 20 foot wide pedestrian access easement and 10 foot wide paved connection from Fendle to Meadows Drive. The project will also be conditioned to site and design a direct Pedestrian connection to the Jay Pearson Park and trail corridor.

The subject property and properties to the north, east, and west, are zoned R-1, and property to the south is zoned R-2. Although the actual sizes of adjacent lots in the R-1 zone range from 4,600 to 6,400 square feet. The average lots proposed in this subdivision range between 5,436 at the smallest and 8,363 square feet at the largest. The proposed lot sizes are similar to the adjacent lots. The predominant surrounding uses are single-family homes and duplexes to the north, single-family homes to the east and south, and Jay Pearson Neighborhood Park to the west. The subject property is currently vacant with a natural drainageway generally running north to south on the property. Most lots would access off the proposed extension of Fendle Way, and six of the lots would access directly off of Meadows Drive

Discussion:

The following are the revised conditions. All numbering has been updated and revised sections have been highlighted below.

The zone change and planned development will become effective 30 days after City Council passes the associated ordinance. The subdivision approval shall expire 12 months from the date the final decision document is signed. Phase Two shall expire five (5) years from the date of this approval. Prior to expiration of the approval, the applicant shall comply with the conditions, execute a Construction Permit Agreement, and commence construction, complete construction, or provide required security, and submit the final plat. Upon written request, the Planning Director may approve a one-year extension of the decision. Additional extensions shall require the subdivider to resubmit the tentative plan to the Planning Commission and make any revisions considered necessary to meet changed conditions.

If the property owner wishes a one-year extension of the Commission approval of this tentative plan under the provisions of MMC Section 17.53.075 (Submission of Final Subdivision Plat) a request for such extension must be filed in writing with the Planning Department a minimum of 30 days prior to the expiration date of this approval.

Planned Development Overlay Requirements

1. The Elysian Subdivision plan shall be placed on file with the Planning Department and become a part of this planned development zone and binding on the developer. The developer will be responsible for requesting approval of the Planning Commission for any major change in the details of the adopted site plan. Minor changes to the details of the adopted plan may be approved by the Planning Director. It shall be the Planning Director's decision as to what constitutes a major or minor change. An appeal from a ruling by the Planning Director may be made only to the Planning Commission. Review of the Planning Director's decision by the Planning Commission may be initiated at the request of any one of the Commissioners.

Attachments:
Attachment A. Stormwater Report (May 2022)
Attachment B. Decision Document with Attachments

2. The following standards shall be recorded with the planned development overlay.

Planned Development Overlay	Proposed Standards
Average Lot Size	6,000 sf
Minimum Lot Width	50 ft.
Minimum Setbacks	
- Front	15 ft.
- Street side	15 ft.
- Side	5 ft.
- Rear	20 ft.
- Garage	20 ft.
Maximum Height	35 ft.
Maximum Lot Coverage	80%
Minimum Landscape Area	20%

3. The majority of delineated wetland be preserved, and a minimum of two (2) wetland viewing areas that are accessible with seating be provided adjacent to the wetlands adjacent to the common open space Tract A. The developer and the Homeowner's Association shall enter into a Revocable License Agreement with the City to establish and maintain wetland viewing areas in the public access easement that are accessible, meet city specifications and are maintained by the developer and Homeowner's Association.

4. The City of McMinnville shall require evidence of compliance with all applicable local, state, and federal standards and regulations for wetland mitigation.

5. The following public amenities shall be included in the 20 foot public access easement connecting Fendle Way to Meadows Drive as approved by the Planning Director.:

   a. Two benches as shown, or other public amenities such as art or stormwater and wetland educational components,

   b. Split rail open black fencing or other fencing style aesthetically pleasing

   c. Any exposed irrigation lines shall be black or camouflaged from the public view.

   d. Walkway lighting shielded down as not to impact adjacent residents.

6. A direct Pedestrian connection to the Jay Pearson Park and the trail corridor is required. This connection shall connect Meadows Drive west to the existing trail corridor along the projects frontage. Approval by the Directors of Planning and Parks and Recreation is required prior to construction.

Subdivision Conditions

PRIOR TO COMMENCING SITE IMPROVEMENTS

7. The Applicant must submit plans showing the following required street improvements to Engineering for review and approval:

   NW Meadows Drive (Minor Collector)
   - o 60' right-of-way dedication
   - o 36' paved width
   - o 0.5' curb

- 6' planter strip
- 5' sidewalk 1' from property line
- 10' public utility easement across road frontage, outside of right-of-way (on both sides of road.)

NW Fendle Way (Local Residential)

- 50' right-of-way dedication
- 28' paved width
- 0.5' curb
- 5' planter strip
- 5' sidewalk 1' from property line
- 10' public utility easement across road frontage, outside of right-of-way (on both sides of road.)
- The sidewalk shall be curb tight through the bulb of the cul-de-sac with the ROW extending 5' behind the sidewalk to place water utilities behind the sidewalk in the cul-de-sac.

8. The access to the storm pond will have a driveway approach with an 8" section of concrete or 6" section with #4 rebar and be PROWAG compliant. The access will be paved to city standards with 10" of 1 ½" – 0 crushed rock under 2" of ¾" – 0 crushed rock and a 3" level 2 WMAC paved section to accommodate maintenance vehicles.

9. The pedestrian access off the end of Fendle Way shall be an improved 10-foot-wide concrete sidewalk connecting to the sidewalk on Meadows Drive. The pedestrian access will be located within a 20 foot wide continuous public access easement.

10. Within the 20 foot public access easement it shall include public amenities such as two benches as shown, walkway lighting, split rail fencing, and upgraded landscaping, or other amenities as approved by the Planning Director.

11. Prior to site work the Developer shall work with Planning and Parks and Recreation staff to site and design a direct Pedestrian connection to the Jay Pearson Park and trail corridor.

12. On-street parking will not be permitted within a 30-foot distance of street intersections measured from the terminus of the curb returns.

13. The City Public Works Department will install, at the applicant's expense, the necessary street signage (including stop signs, no parking signage, and street name signage), curb painting, and striping (including stop bars) associated with the development. The applicant shall reimburse the City for the signage and markings prior to the City's approval of the final plat.

14. The applicant shall submit cross sections for the public street system to be constructed. Cross sections shall depict utility location, street improvement elevation and grade, park strips, sidewalk location, and sidewalk elevation and grade. Said cross sections shall be submitted to the City Engineer for review and approval prior to submittal of the final plat. All such submittals must comply with the requirements of 13A of the Land Division Ordinance and must meet with the approval of the City Engineer.

15. Street grades and profiles shall be designed and constructed to meet the adopted Land Division Ordinance standards and the requirements contained in the Public Right-of-Way Accessibility Guidelines (PROWAG). Additionally, corner curb ramps shall be constructed to meet PROWAG requirements.

16. That the street improvements shall have the City's typical "teepee" section.

Attachments:
Attachment A. Stormwater Report (May 2022)
Attachment B. Decision Document with Attachments

17. The applicant shall secure from the Oregon Department of Environmental Quality (DEQ) any applicable storm runoff and site development permits prior to construction of the required site improvements. Evidence of such permits shall be submitted to the City Engineer.

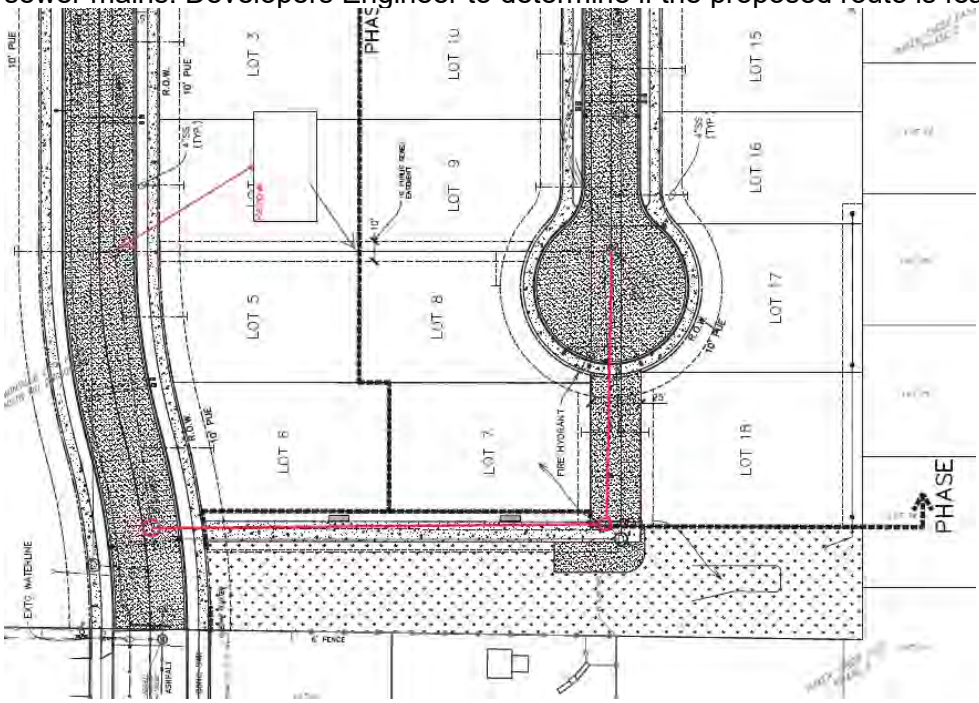
18. The applicant shall secure all required state and federal permits, including, if applicable, those related to construction of the storm drain outfalls, the federal Endangered Species Act, Federal Emergency Management Act, and those required by the Oregon Division of State Lands, and U.S. Army Corp of Engineers. Copies of the approved permits shall be submitted to the City.

19. That the applicant submit evidence that all fill placed in the areas where building sites are expected is engineered. Evidence shall meet with the approval of the City Building Division and the City Engineering Division.

SANITARY SEWER

20. A detailed, engineered sanitary sewage collection plan, which incorporates the requirements of the City's adopted Conveyance System Master Plan, must be submitted to and approved by the City Engineering Department. Any utility easements needed to comply with the approved sanitary sewage plan must be reflected on the final plat.

21. The City is proposing an alternate route for the sewer main as it prefers to avoid side lot sanitary sewer mains. Developers Engineer to determine if the proposed route is feasible.



STORM DRAINAGE

22. Prior to site work a detailed, engineered storm drainage plan, which satisfies the requirements of the City's Storm Drainage Master Plan, and that demonstrates that the existing downstream storm drainage system has adequate capacity, must be submitted to and approved by the City Engineering Department. Any utility easements needed to comply with the approved plan must be reflected on the final plat.

23. No additional storm drainage runoff shall be conveyed onto any adjacent property without the appropriate public and/or private storm drainage easements. Copies of recorded private

easements must be provided to the City prior to the City's approval of the final plat. Any offsite public easements must be dedicated to and accepted by the City prior to the City's approval of the final plat. The HOA will be responsible for the maintenance for the wetland plantings and fencing.

PRIOR TO FINAL PLAT

24. Submit documents creating a Homeowner's Association for the subdivision and assigning to it maintenance responsibilities of any common ownership features must be submitted to and approved by the Planning Director. In order to assure that the Homeowner's Association maintains and repairs any needed improvements, the Covenants, Conditions, and Restrictions (CC&Rs) shall explicitly require the Homeowner's Association to provide notice to the City prior to amending the CC&Rs, and that all such amendments shall be subject to approval by the Planning Director. Additionally, the CC&Rs shall prohibit the Homeowner's Association from disbanding without the consent of the Planning Director. The CC&Rs shall be reviewed by and subject to City approval prior to final plat approval.

25. Prior to final plat the restrictive Covenants, Conditions, and Restrictions (CC&Rs) shall be prepared for the development and approved by the Planning Director.

26. The final plat shall reflect that access to the detention pond will be granted to the City for maintenance of the structures.

27. The final plat shall reflect that Tract A will be private.

28. The final plat shall reflect that the pedestrian pathway within tract A will be privately maintained but have a public access easement over its entirety. The tract shall have private maintenance agreements which must be approved by the City prior to the City's approval of the final plat.

29. The final plat shall reflect that the sanitary line between Fendle Way and Meadows Dr shall be public.

30. Street names shall be submitted to the Planning Director for review and approval prior to submittal of the final plat.

31. The final plat shall include 10-foot public utility easements along both sides of all public rights-of-way for the placement and maintenance of required utilities.

32. The final plat shall include use, ownership, and maintenance rights and responsibilities for all easements and tracts.

33. The final plat shall include a public access easement from the terminus of Fendle Way to Meadows Drive.

34. The required public improvements shall be installed to the satisfaction of the responsible agency prior to the City's approval of the final plat. Prior to the construction of the required public improvements, the applicant shall enter into a Construction Permit Agreement with the City Engineering Department, and pay the associated fees.

35. Prior to final plat the applicant shall submit a draft copy of the subdivision plat to the City Engineer for review and comment which shall include any necessary cross easements for access to serve all the proposed parcels, and cross easements for utilities which are not contained within the lot they are serving, including those for water, sanitary sewer, storm sewer, electric, natural gas, cable, and telephone. A current title report for the subject property shall be submitted with the draft plat. Two copies of the final subdivision plat mylars shall be submitted to the City Engineer for the appropriate City signatures. The signed plat mylars will be released

to the applicant for delivery to McMinnville Water and Light and the County for appropriate signatures and for recording.

36. The City will not maintain the proposed enhanced wetland facility or proposed bioswale along the south boundary of the subject property. The City will maintain the structures (inlets, outfalls, WQ manholes, flow control MH's, etc).

37. All of Tract A, including the proposed wetland and associated pedestrian path should remain private.

38. Prior to final plat the applicant shall submit an application for a street tree plan and landscaping for Tract A and the pedestrian path to the Landscape Review Committee for review and approval prior to final plat submittal in accordance with Section 17.58. 100 of the Zoning Ordinance. The plan shall provide sufficient detail about location of utility services to the lots, locations of street lights, pedestals, and meter boxes, to evaluate the suitability of proposed street tree planting locations.

39. Prior to final plat all street trees shall be installed or security in place. All trees shall be a two-inch minimum caliper, exhibit size and growing characteristics appropriate for the particular planting strip, and be spaced as appropriate for the selected species and as may be required for the location of above ground utility vaults, transformers, light poles, and hydrants.

40. Submit a Subdivision Design Application form to McMinnville Water and Light. The project will require the developer to enter into a Line Extension Agreement (contract) with McMinnville Water and Light (MW&L). The public water system will need to be designed by the Developer's engineer and reviewed/approved by MW&L.

41. Submit a Subdivision Design Application form to McMinnville Water and Light. The project will require the developer to enter into a Line Extension Agreement (contract) with McMinnville Water and Light. The portion of the PUE included in the Drainage Improvements abutting NW Meadows needs to be constructed with an elevation and profile that ensures utilities can be extended through it in a typical manner.

PRIOR TO ISSUANCE OF BUILDING PERMITS

42. The applicant shall coordinate the location of clustered mailboxes with the Postmaster, and the location of any clustered mailboxes shall meet the accessibility requirements of PROWAG and the State of Oregon Structural Specialty Code.

43. The applicant shall install fire hydrants to serve this development as may be required by the McMinnville Fire Department. Also, if fire hydrants are required, they shall be in working order prior to the issuance of building permits.

44. On-street parking will be restricted at all street intersections, in conformance with the requirements of the City's Land Development Ordinance.

45. The applicant shall provide a minimum of twenty-five percent (25%) of the single-family lots for sale to the general public. The applicant shall provide information detailing the number of lots that will be made available for individual sale to builders for review and approval by the Planning Director prior to recording of the final plat. Upon approval, the referenced lots will be made available for sale to the general public for a minimum of one hundred eighty (180) days.

46. Prior to issuance of building permits all applicable SDCs, including Parks SDCs shall be paid.

47. Prior to issuance of building permits Housing Variety shall be ensured. The neighborhood shall have a variety of building forms and architectural variety to avoid monoculture design.

Attachments:
Attachment A. Stormwater Report (May 2022)
Attachment B. Decision Document with Attachments

48. If a security was provided prior to final plat for installation of street trees, the applicant shall complete installation of street trees, per the timing described in Subsection (B) below. The applicant shall plant street trees within curbside planting strips in accordance with the approved street tree plan. All street trees shall be of good quality and shall conform to American Standard for Nursery Stock (ANSI Z60.1). The Planning Director reserves the right to reject any plant material which does not meet this standard.

    A. Trees shall be provided with root barrier protection in order to minimize infrastructure and tree root conflicts. The barrier shall be placed on the building side of the tree and the curb side of the tree. The root barrier protection shall be placed in 10-foot lengths, centered on the tree, and to a depth of eighteen (18) inches. In addition, all trees shall be provided with deep watering tubes to promote deep root growth.

    B. Each year the applicant shall install street trees, from November 1 to March 1, adjacent to those properties on which a structure has been constructed and received final occupancy. This planting schedule shall continue until all platted lots have been planted with street trees.

    C. It shall be the applicant's responsibility to relocate trees as may be necessary to accommodate individual building plans. The applicant shall also be responsible for the maintenance of the street trees, and for the replacement of any trees which may die, ~~due to neglect or vandalism~~. for one year from the date of planting

49. Any improvements which were secured prior to final plat approval shall be completed in accordance with the construction permit agreement.

Stormwater Report
The updated stormwater report is Attachment A to this packet dated May 2022. Project Engineer, Jeff Gooden in coordination with on-call consultant at David Evans and Associates have reviewed the stormwater report. They will provide an overview and update of the review at the hearing.

Public Comments
Notice of the proposed application was mailed to property owners and published in the newspaper.

Agency Comments
Notice of the proposed application was sent to affected agencies and departments. Agency comments were received from the Engineering Division and the Oregon Department of State Lands. Those comments are noted in the Decision Document and addressed as conditions when applicable.

Fiscal Impact:

None.

5. Planning Commission Options (for Quasi-Judicial Hearing):

1) **RECOMMEND APPROVAL** of the applications to the City Council as proposed by the applicant with the conditions recommended in the attached Decision Documents, per the decision documents provided which includes the findings of fact.
2) **CONTINUE** the public hearing to a specific date and time.
3) Close the public hearing, but **KEEP THE RECORD OPEN** for the receipt of additional written testimony until a specific date and time.

Attachments:
Attachment A. Stormwater Report (May 2022)
Attachment B. Decision Document with Attachments

4) Close the public hearing and **DENY** the application, providing findings of fact for the denial, specifying which criteria are not satisfied, or specifying how the applicant has failed to meet the burden of proof to demonstrate all criteria are satisfied, in the motion to deny.

NOTE: *While a Planning Commission recommendation of approval of the application (or approval of the application in a different form) is transmitted to the City Council to make a final decision, a Planning Commission recommendation of denial is a final decision unless the decision is appealed to the City Council. MMC 17.72.130.*

6. Staff Recommendation:

Staff has reviewed the proposals for consistency with the applicable criteria. Absent any new evidence or findings to the contrary presented during the hearing, staff finds that, subject to the recommended conditions specified in the attached Decision Documents, the application submitted by the applicant and the record contain sufficient evidence to find the applicable criteria are satisfied.

Staff **RECOMMENDS APPROVAL** of the applications, subject to the conditions specified in the attached Decision Documents, respectively.

7. Suggested Motions:

1. **ZC 1-22, PD 1-21, AND S 1-21. BASED ON THE FINDINGS OF FACT, THE CONCLUSIONARY FINDINGS FOR APPROVAL, THE MATERIALS SUBMITTED BY THE APPLICANT, AND EVIDENCE IN THE RECORD, I MOVE THAT THE PLANNING COMMISSION APPROVE THE DECISION DOCUMENT AND RECOMMEND APPROVAL OF ZONE CHANGE, PLANNED DEVELOPMENT OVERLAY, AND SUBDIVISION APPLICATION CASE NUMBERS ZC 1-22, PD 1-21, AND S 1-21, SUBJECT TO THE CONDITIONS SPECIFIED IN THE DECISION DOCUMENT.**

Attachments:
Attachment A. Stormwater Report (May 2022)
Attachment B. Decision Document with Attachments

STORMWATER MANAGEMENT REPORT

Prepared For:

VJ2 Development

695 Commercial Street

Salem, OR 97301

Project Location:

Elysian Subdivision

2280-2298 NW Fendle Way

McMinnville, OR 97128

Prepared By:

PRELIMINARY FOR REVIEW

Westech Engineering, Inc.
3841 Fairview Ind. Dr. SE, Suite 100
Salem, OR 97302
(503) 585-2474 FAX: (503) 585-3986

J.O. 2931.0000.0

May 2022

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APPENDICES

Section A. Project Introduction

Summary of Improvements

The proposed project is located on an approximate 4.11-acre parcel south of West Baker Creek Road and between the north and south termini of Meadows Drive in McMinnville, Oregon in Yamhill County. Refer to the Supplemental Civil Drawings in Appendix VI for a site map of the project area.

The existing site contains undeveloped agricultural land and mitigated wetlands. The project scope is to develop the site for 18 single-family residential lots with associated improvements, connecting Meadows Drive from the north-south, and designated open grassed areas. The project includes site preparation and construction of the facilities which will include new roads, sidewalks, and associated public improvements.

Stormwater improvements associated with the project include the construction of a stormwater quality treatment and detention facility.

Purpose of Stormwater Quality & Detention

The purpose of the stormwater quality and detention facilities are to remove pollutants from developed stormwater runoff and control the stormwater release rates to mimic rates that occurred in predeveloped site conditions. Management of stormwater for quality and quantity is required within the project drainage area to mitigate stormwater impacts in order to comply with project DEQ 401 Certification, Section 404 permit, City of McMinnville stormwater design standards, and National Marine Fisheries Service (NMFS) SLOPES V standards.

Regulatory Agency Approvals

Impacts to jurisdictional wetlands and drainage ways are proposed with the Elysian Subdivision project. Construction of proposed site improvements will impact jurisdictional wetlands. It is anticipated that conformance to the SLOPES V regulations will be required due to the wetland impacts.

In order to expedite projects, the Army Corps of Engineers (COE) in cooperation with NMFS has created the SLOPES V guidelines, dated March 14, 2014. In this document NMFS has issued a programmatic biological opinion with a conclusion by NMFS that compliance with SLOPES V guidelines is not likely to jeopardize the continued existence of a variety of endangered native salmon and steelhead fish species.

The SLOPES V document specifies a number of criteria that must be met for design and construction and/or refurbishment of a facility that impacts the regulated body of water as well as criteria for management of stormwater discharged from improved roadway surfaces within the project's contributing drainage basin area.

This Stormwater Management Report will address the stormwater requirements of the SLOPES V guidelines and the City of McMinnville stormwater design standards when City standards are more restrictive.

Summary of Agency Stormwater Quality and Detention Requirements

Below is a summary of the SLOPES V guidelines and the City of McMinnville standards.

SLOPES V Guidelines:

- Water quality facilities must be designed to treat for post-construction stormwater runoff from all contributing impervious area for 50% of the 2-year event (i.e., 1.3 inches in a 24-hour period).
- 50% of the developed 2-year peak flow rate and duration matches 50% of the predeveloped 2-year peak flow and duration.
- The developed 10-year peak flow rate and duration matches the predeveloped 10-year peak flow rate and duration.
- Use low impact development (LID) to infiltrate or evaporate runoff to the maximum extent feasible (MEF).
- Stormwater treatment is required for all contributing impervious area.

City of McMinnville Stormwater Standards:

- The developed 10-year peak flow rate must be equal to or less than the peak runoff rate of the predeveloped 10-year, 24-hour storm event.

For this project all contributing impervious area per SLOPES V is treated to the SLOPES V standards. Stormwater runoff will also be controlled to the SLOPES V standards except where the City of McMinnville Standards are more conservative. The City of McMinnville Standards are the same or less conservative than the SLOPES V standards and therefore stormwater runoff will also be controlled to the SLOPES V standards as summarized above.

Summary of Stormwater Facilities

The proposed stormwater facility will be designed to treat runoff from the proposed developments and provide detention per SLOPES V standards. The following sections describe the facilities used for stormwater treatment and detention. The entire site drains to a ditch running through the southern portion of the property which will eventually flow into Cozine Creek. The drainage basin runoff will be controlled by a flow control structure at the outlet from the LID facility.

1. Developed Basin

The stormwater from the Developed Basin (the entire site) is treated and detained via a vegetated swale LID at the bottom of a dry detention pond. The LID facility is located in the southeastern corner of the site and is irregular in shape.

Section B. Stormwater Plan Narrative

Pollutants of Concern

The Elysian Subdivision project consists of new roads, sidewalks, designated open grassed areas, and associated improvements. The impervious area within the project scope that contributes pollutants to the stormwater runoff primarily consists of roads, driveways, and roof runoff. These sources all create project pollutants of concern most commonly associated with residential development runoff. The Oregon Department of Environmental Quality (DEQ) lists the following as common pollutants associated with residential development runoff:

- Solids and Sediment
- Metals (zinc, copper, lead, etc.)
- Petroleum Hydrocarbons (oil, grease, etc.)
- Nutrients (nitrogen, phosphorous, etc.)
- Pesticides, Herbicides & Fungicides

Name and Status of Receiving Waters

Stormwater from the project site discharges into the North Branch Cozine Creek which then flows to Cozine Creek, the South Yamhill River, Yamhill River, and joins the Willamette River at approximate river mile 55.

Cozine Creek is 303(d) listed for biological criteria and dissolved oxygen year-round and listed for E. coli and temperature in summer.

The Yamhill River is 303(d) listed for biological criteria, copper, iron, lead, mercury, and temperature year-round. The Yamhill is also listed for dissolved oxygen January - May, and listed for E. coli and fecal coliform in fall/winter/spring. The Yamhill is TMDL approved for chlorophyll year-round and pH and phosphorus May – October.

The Willamette River is 303(d) listed for mercury year-round and listed for chlorophyll in summer. The Willamette is also TMDL approved for temperature year-round and E. coli in fall/winter/spring.

Refer to Appendix I for a copy of DEQ's water quality assessment, identification of pollutants sampled and water body status for the streams mentioned above.

The SLOPES V standards are designed to protect streams from stormwater runoff from developed sites. By designing stormwater facilities to SLOPES V standards TMDLs will not be infringed upon. Furthermore, dissolved oxygen (DO) will not be impacted because DO-reducing pollutants will be removed through contact with the vegetation and amended topsoil in the designed vegetated swale. Fecal coliform and E. Coli will not be increased because storm drains are not susceptible to fecal sources. Phosphorus will be sufficiently removed through the vegetated swale. For chlorophyll and pH, the primary pollutant is phosphorus, which the swale is designed to remove. Temperature is primarily impacted by removal of shade trees along stream banks and stream widening. No trees

are proposed for removal along the stream bank nor is the stream proposed to be modified. Biological criteria TMDLs will not be infringed on because the vegetated swale is designed to treat urban stormwater runoff to safe levels for aquatic species.

Groundwater Management Area

Upon review of available groundwater management information on the Oregon DEQ website it does not appear the project is within a groundwater management area or EPA-designated sole source aquifer.

NPDES Permit Sites

Refer to Appendix I for a list of Oregon DEQ water quality permitted facilities in the McMinnville area.

Contributing Impervious Area

The proposed project will generate approximately 2.73 acres of impervious area on the 4.11-acre site. This area was calculated by measuring the road coverage (assumed 100% impervious) and residential lot coverage (assumed 65% impervious) of the proposed development. The contributing area was analyzed as one basin for predeveloped and developed conditions as shown on the drawings in Appendix II. Refer to Section C of this report and the HydroCAD Analysis in Appendix III for more details.

LID and MEF per SLOPES V Standards

The SLOPES V standards require stormwater facilities to utilize low impact development (LID) practices to infiltrate and evaporate runoff to the maximum extent feasible (MEF).

To meet the SLOPES V requirement, the proposed stormwater design treats 100% of the impervious surface with LID. The design utilizes a vegetated swale at the bottom of a dry detention pond (see Appendix II and V for more details).

Narrative Description of Stormwater Management Plan

The proposed stormwater LID for the treatment of stormwater were designed per Clean Water Services design standards for vegetated swales. Clean Water Services standards were used because the City of McMinnville has not adopted LID standards for residential development at this time. Detention and water quality for the site are provided by a vegetated swale at the bottom of a dry detention pond. Refer to Appendix II for a map of the site.

For design of the LID please refer to Sections C and D.

1. Constraints

   There are several project constraints that were addressed to accommodate stormwater quality treatment and detention. These constraints included wetland impacts, low infiltration rates of the existing soils, and limited grade.

The following sections describe how project constraints were accommodated.

1) Developed Basin

Due to the lack of infiltration on site the detention facilities required a larger footprint. Additionally, the stormwater facility has limited grade drop available from the existing inlet to the discharge point in the ditch on the south side of the property. Rain gardens or similar LID facilities were ruled out as design possibilities for the site due to the grade drop required by their large sections of media and drain rock.

The site plan was modified to accommodate the required detention and water quality facilities.

Pollutant Removal Summary

An integrated approach has been taken to address the pollutants of concern (sediment, metals, pest-herb-fungicides, and hydrocarbons) that can be expected to be produced in this project. The proposed water quality LIDs in this document remove sediment, metals, organics, and petroleum hydrocarbons.

As illustrated in Appendix VI, site runoff discharges to a ditch running through the south portion of the property which eventually flows into Cozine Creek. The LID is sized to meet the requirements of Clean Water Services design standards. Please refer to Section C for the facility sizing.

Section C. Basin Characteristic and Flow Control Summary

The following sections describe the hydrology of the predeveloped site and flow control provided to conform to City of McMinnville and SLOPES V standards.

Hydrological Summary

The project site plan will utilize LID to the MEF per SLOPES V standards. The stormwater system will consist of a vegetated swale at the bottom of a dry detention pond to treat and detain the stormwater generated from the project area (contributing impervious area per SLOPES V).

Hydrologic Parameters, Existing and Developed Conditions

The hydrologic parameters that were used to complete the water quality and detention calculations are discussed below. The hydrologic parameters include basin areas, curve numbers (CN), predeveloped and developed time of concentrations (Tc), 24-hour rainfall depths for each recurrence interval, and the hydrological analysis method used to generate hydrographs. These basin characteristics are summarized in Table C-1, Table C-2, and Table C-3.

1) Hydrologic Analysis Methodology

HydroCAD modeling software was used to size the stormwater facilities. The Santa Barbara Unit Hydrograph Type 1A storm was used to model the required design storms. Design storms used were the, half the 2-year, 24-hour (also used as the water quality storm) and the 10-year, 24-hour storm events.

2) 24-Hour Rainfall Depths

In accordance with SLOPES V and City of McMinnville standards the storm events used in this report include the half the 2-year (also used as the water quality storm) and the 10-year, 24-hour rainfall events as listed in Table C-1. These stormwater depths were determined from the Precipitation Frequency Atlas (Atlas 2) maps developed by the National Oceanic and Atmospheric Administration (NOAA) for the State of Oregon. Refer to Appendix III for the Atlas 2 maps.

Table C-1| 24-Hour Design Storm Rainfall Depths

	24-Hour Rainfall Depths for McMinnville, OR				
Recurrence Interval, Years	2	10	25	50	100
24-Hour Depths, Inches	2.6	3.8	4.2	4.7	5.2

Source: NOAA Atlas 2 maps

3) Curve Number Determination

The developed and predeveloped basins consist of an area of 3.78 acres on the 4.11-acre site. Curve numbers were assigned per the USDA Soil Conservation

Service's Technical Release 55 (TR-55) recommendations. See Appendix III for the NRSC soil survey maps of the project area, that correspond to basin CN's.

The predeveloped site is predominately grass-covered and was assigned an area-weighted average curve number of 77. The native soils onsite are a mixture of C and C/D-rated soils. Per the NRCS Soil Report, a C/D classification indicates a D rating for natural soil conditions. Soils with a C/D classification are therefore assumed D-rated for predeveloped conditions. The CN is weighted by the area of C and D-rated soils on the site with good coverage of pasture/grassland.

The Developed Basin was assigned an area-weighted average curve number of 92. This corresponds to 1.05 acres of pervious area, CN of 77, and 2.73 acres of impervious area, CN of 98.

4) Time of Concentration Determination

Predeveloped and developed Tc's were calculated for each basin using the TR-55 design guidelines utilizing sheet and shallow concentrated flow equations.

Table C-2 summarizes the Tc equation inputs for the predeveloped and developed Tc's. The developed Tc used was 5 minutes, which is the minimum Tc that can be used by the modeling software. The developed Tc may be a little longer than 5 minutes, but 5 minutes was used to add a factor of safety into the model, as a lower developed Tc increases the developed flows slightly.

Table C-2| Basin Time of Concentration Characteristics

Basin ID	Overland Flow Length (ft)	Manning's n	Slope of Overland Flow (ft/ft)	Tc (Min.)
Pre Developed	525	0.15	0.01	42.9
Developed	-	-	-	5

5) Basin Characteristics

Table C-3 provides a summary of the developed onsite drainage basins' impervious and pervious area (used for the developed calculations), and the predeveloped and developed curve numbers (CN) as previously discussed.

Table C-3| Hydrologic Parameters

Basin ID	Source (Roof/Road/ Other)	Impervious Area (AC)	Pervious Area (AC)	Design Storm		Weighted CN
				½ 2 Year (cfs)	10 Year (cfs)	
Predeveloped	Native	-	3.78	0.14	0.76	77
Developed	Road/Roof/ Landscape	2.73	1.05	0.78	2.86	92

Hydrologic Analysis

The hydrological analysis, as previously mentioned, was completed using HydroCAD Modeling Software utilizing the SBUH method and a Type IA 24-hour rainfall distribution. A listing of the predeveloped peak flows for half the 2-year and 10-year storm events are found in Table C-4. Refer to Appendix III for hydrographs for each predeveloped and developed storm events.

Table C-4| Calculated Allowable Peak Flows

Basin Area/Facility	Design Storm (cfs)	
	½ 2 Year	10 Year
Predeveloped Site	0.14	0.76

Flow Control System Design

Based on the flow control requirements described in Section A, the flow control structure was sized to detain the developed storm events and release the stored runoff at allowable peak flow rates as described above. Refer to the drawings in Appendix II for more details on detention and flow-control design. A summary of the stormwater detention requirements are listed below:

- Capture half the 2-yr developed runoff to be released at a rate equal to or less than half the 2-yr peak predeveloped rate.
- Capture the 10-yr developed runoff to be released at a rate equal to or less than the 10-yr peak predeveloped rate.

The flow control structure is designed to meet the stormwater release and detention requirements above. See Table C-5 for a summary of outlet sizing and developed release rates. The flow control structure consists of two (2) outlets at differing elevations within a flow control manhole to control the design storms. Refer to Civil Drawings in Appendix VI for details.

Table C-5| Summary of Flow Control

Storm Event	Outlet Size (in)	Outlet Elevation (ft)	Peak WSE[1] (ft)	Release Rate (cfs)	Allowable Release Rate (cfs)
½ 2 year	2.4	156.60	157.56	0.14	0.14
10 year	3.9	157.70	159.38	0.76	0.76
100 year Emergency O/F[2]	12	159.40	159.82	3.30	-

[1] WSE = Water Surface Elevation

[2] Emergency O/F provided by weir cut in top of pond.

Evaluation of the allowable (Table C-4) and post developed (Table C-5) release rates confirms the stormwater design is in conformance with the SLOPES V design standards. Refer to Appendix III for the HydroCAD Analysis.

Conveyance Capacity Calculations

The stormwater facilities were designed to convey the developed 10-year, 24-hour storm. The 10-year storm produces 0.76 cfs of runoff after detention. Within the subdivision 8-inch pipes flow into a 12-inch pipe and then into a 15-inch pipe which then outfalls into the detention pond/swale. The 8-inch pipes have a conveyance capacity of 0.77 cfs, the 12-inch pipes have a conveyance capacity of 2.25 cfs, and the 15-inch pipes have a conveyance capacity of 4.09 cfs, therefore the pipe sizing is adequate to convey the 10-year storm.

The new 15-inch pipe connects to a relocated drainage ditch and then flows into a new 24-inch pipe at a slope of 0.16%. The new 24-inch pipe has a capacity of 10.45 cfs. The amount of runoff produced for the site will occupy 7.2% of the 24-inch pipe capacity. By inspection, the downstream 24-inch pipe has adequate capacity to convey the 10-year storm.

The existing 21” pipe in Meadows drive connects to an upsized 24” pipe. The existing 21” pipe has a conveyance capacity of approximately 10.02 cfs. The new 24” pipe connecting to the upstream, existing 21” pipe has a capacity of 14.31 cfs. We have increased the downstream pipe capacity in meadows drive by approximately 43%.

Section D. Water Quality Design

The stormwater management plan for the project utilizes a vegetated swale to provide water quality treatment. The developed site conditions produce 0.78 cfs of detained runoff during the water quality storm event. Refer to Appendix III for a hydrograph of the developed water quality storm event (i.e. the half 2-year event). The section below describes the water quality design provided by LID of the proposed stormwater management design. The HydroCAD modeling results show that all runoff flows through the vegetated swale with a satisfactory residence time and depth during the water quality event.

Vegetated Swales

The wetlands on site deem stormwater infiltration facilities infeasible. Due to the lack of infiltration, a flow-through vegetated swale is proposed to treat the water quality storm with an LID facility. Infiltration was assumed to be zero in the design. The site plan was modified to incorporate a vegetated swale which is used to provide water quality treatment for the entire proposed development and existing offsite drainage.

The vegetated swale contains dense vegetation along the bottom and will be landscaped in accordance with Clean Water Services standards (see Appendix V). Clean Water Services standards were used because the City of McMinnville has not adopted LID standards for residential development at this time.

See Table D-1 below for a summary of the vegetated swale design. Refer to the drawings in Appendix II for swale sizing summaries and Appendix III for HydroCAD Analysis of the designed vegetated swale.

Table D-1 | Summary of Vegetated Swale Design

Clean Water Services Design Standards		
Criteria	Allowable	Designed
Manning's n	0.24	0.24
Max. Water Quality Flow Depth (ft)	0.5	0.37
Min. hydraulic Residence Time (min)	9	18.9
Max. Conveyance Flow Velocity (fps)	2.0	0.19
Min. Length (ft)	100	215
Min. Bottom Width (ft)	2	9

After treatment, the swale discharges to a ditch running through the south portion of the property after passing through a flow control structure. Refer to the drawings in Appendix II and the Supplemental Civil Drawings in Appendix VI for more details.

Section E. Storm Drain System Operation & Maintenance

All facilities constructed as a part of this project will be owned, operated, and maintained by Don Jones for the Elysian Subdivision. Don Jones proposes to maintain the LID structure in accordance with the Operation and Maintenance Manuals included in Appendix IV.

Elysian Subdivision
McMinnville, Oregon
Stormwater Management Report

APPENDIX I

Environmental Watershed Data

RECEIVING WATERS TMDL STATUS

Department of Environmental Quality

3/5/2020 2:06:41 PM (Page 1 of 1)

Oregon's 2012 Integrated Report Cozine Creek

To select new search criteria **click here** (search.asp#db) - **DO NOT USE THE BACK ARROW**

Refresh Report | Show All Records | Records per page: 100

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Basin Name Subbasin 4th Field HUC Record ID	Water Body LLID River Miles Segment Miles Beach Name Beach ID	Pollutant	Season	Criteria	Beneficial Uses	Status	2012 Assessment Action	[Data Source] Supporting Data
Willamette Yamhill 17090008 24588	Cozine Creek 1231877452053 0 to 6.8 6.8	Dissolved Oxygen	January 1 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation		Cat 5: Water quality limited, 303(d) list, TMDL needed	No status change	2012 Data: [DEQ] STATION 34234 at RM 0.4 from 03/16/2007 to 04/20/2010, 16 of 21 (76%) samples < 11.0 mg/l and < 95% saturation 2010 Data: EPA addition to 303(d) list 12/14/2012: Sixteen exceedences of the spawning criteria out of 22 days of sampling between 3/16/07 and 4/27/10at LASAR station 34234, Lower Cozine Creek at Davis Street Bridge. Fourteen exceedences of the spawning criteria out of 22 days of sampling between 3/16/07 and 4/27/10 at LASAR station 34235, Middle Cozine at Old Sheridan Road. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: EPA addition to 303(d) list Previous Assessment Year: 2010

Willamette Yamhill 17090008 24587	Cozine Creek 1231877452053 0 to 5 5	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l		Cat 5: Water quality limited, 303(d) list, TMDL needed	No status change	2012 Data: [DEQ] STATION 30677 at RM 0.1 from 07/05/2008 to 07/05/2008, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 34234 at RM 0.4 from 05/19/2007 to 10/12/2010, 7 of 15 (47%) samples < 6.5 mg/L. [DEQ] STATION 35065 at RM 2.5 from 07/05/2008 to 07/05/2008, 0 of 1 (0%) samples < 6.5 mg/L 2010 Data: EPA addition to 303(d) list 12/14/2012: Seven exceedences of the cool water aquatic life criterion out of 16 days of sampling between 5/19/07 and 10/12/10 at LASAR station34234, Lower Cozine Creek at Davis Street Bridge. Two exceedences of the cool water aquatic life criterion out of 16 days of sampling between 5/19/07 and 10/12/10 at LASAR station 34235, Middle Cozine at Old Sheridan Road. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: EPA addition to 303(d) list Previous Assessment Year: 2010
Willamette Yamhill 17090008 24589	Cozine Creek 1231877452053 0 to 6.8 6.8	E. Coli	Summer	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	2010 Data: EPA addition to 303(d) list 12/14/2012: Seven exceedences of the 406 maximum criteria out of 9 days of sampling at LASAR station 30877, Cozine Creek at mouth (South Yamhill), between 8/26/03 and 9/15/04. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: EPA addition to 303(d) list Previous Assessment Year: 2010
Willamette Yamhill 17090008 7052	Cozine Creek 1231877452053 0 to 6.8 6.8	Fecal Coliform	Undefined		Water contact recreation	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 24590	Cozine Creek 1231877452053 0 to 6.8 6.8	Temperature	Year Round	Rearing: 17.8 C		Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	2010 Data: EPA addition to 303(d) list 12/14/2012: Exceedences of the salmonid rearing criterion (18C) as high as 22.1 C in July 2003 and 23.1 C in July 2004 at LASAR station 30677, Cozine Creek at mouth (South Yamhill). Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: EPA addition to 303(d) list Previous Assessment Year: 2010
Willamette Yamhill 17090008 25910	North Branch Cozine Creek 1232010452090 0 to 1.7 1.7	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l		Cat 3: Insufficient data	Added to database	2012 Data: [DEQ] STATION 35067 at RM 0.1 from 07/05/2008 to 07/05/2008, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 35066 at RM 0.2 from 07/05/2008 to 07/05/2008, 0 of 1 (0%) samples < 6.5 mg/L

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Contact

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Basin Name Subbasin 4th Field HUC Record ID	Water Body LLID River Miles Segment Miles Beach Name Beach ID	Pollutant	Season	Criteria	Beneficial Uses	Status	2012 Assessment Action	[Data Source] Supporting Data
Willamette Yamhill 17090008 17292	South Yamhill River 1231445452258 0 to 61.8 61.8	Alkalinity	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 3B: Insufficient data, potential concern	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 12/22/2003, 11 out of 88 samples < 20 mg/L (Table 20 criterion). Previous Status: Cat 3B: Potential concern Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 17293	South Yamhill River 1231445452258 0 to 61.8 61.8	Ammonia	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 12/22/2003, 0 out of 136 samples > applicable Table 20 criterion. Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 25897	South Yamhill River 1231445452258 0 to 61.7 61.7	Arsenic	Year Round	Table 40 Human Health Criteria for Toxic Pollutants	Human health; Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 33885 at RM 14.9 for 1 samples from 09/20/2006 to 09/20/2006, 0 of 1 valid samples exceed the 2.1 ug/L criteria. [ODEQ] STATION 10948 at RM 16.7 for 11 samples from 04/15/2008 to 02/17/2010, 0 of 11 valid samples exceed the 2.1 ug/L criteria. [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the 2.1 ug/L criteria
Willamette Yamhill 17090008 7304	South Yamhill River 1231445452258 0 to 18.1 18.1	Atrazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25901	South Yamhill River 1231445452258 0 to 61.7 61.7	Cadmium	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 11 samples from 04/15/2008 to 02/17/2010, 0 of 11 valid samples exceed the hardness dependent criteria

Willamette Yamhill 17090008 17294	South Yamhill River 1231445452258 0 to 18.1 18.1	Chlorophyll a	FallWinterSpring	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Aesthetics; Livestock watering; Water supply; Water contact recreation; Fishing	Cat 3: Insufficient data	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 5/23/1995 to 5/31/1995, average Chlorophyll a of 0.012 for 1 samples in 1 months. Previous Status: Cat 3: Insufficient data Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 6249	South Yamhill River 1231445452258 0 to 18.1 18.1	Chlorophyll a	Summer	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Fishing; Aesthetics; Livestock watering; Water contact recreation; Water supply	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 7/2/1996 to 9/29/1996, average Chlorophyll a of 0.005 for 3 samples in 3 months. Previous Data: DEQ Data (3 Sites: 402623, 402624, 402625; RM 1.0 - 16.5): 29% (2 of 7), 0% (0 of 19, 50) Summer values respectively exceeded chlorophyll a standard (15 ug/l) with a maximum value of 20 between WY 1986 - 1995. Did not meet "Minimum Data Requirements", data did not exceed the 3-month average criteria. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 6880	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Chlorophyll a	Summer	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Water contact recreation; Water supply; Aesthetics; Livestock watering; Fishing	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402627; RM 36.0): 0% (0 of 13) Summer values exceeded chlorophyll a standard (15 ug/l) between 1986 - 1988. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6882	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Chlorophyll a	Summer	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Water contact recreation; Aesthetics; Livestock watering; Water supply; Fishing	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 0% (0 of 5) Summer values exceeded chlorophyll a standard (15 ug/l) between 1986 - 1987. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25895	South Yamhill River 1231445452258 0 to 61.7 61.7	Chromium	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 9 samples from 04/15/2008 to 02/17/2010, 0 of 9 valid samples exceed the 11 ug/L criteria
Willamette Yamhill 17090008 7146	South Yamhill River 1231445452258 0 to 18.1 18.1	Copper	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 5: Water quality limited, 303(d) list, TMDL needed	Status modification - Added to 303(d) list	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 10 samples from 04/15/2008 to 02/17/2010, 4 of 10 valid samples exceed the hardness dependent criteria Previous Data: Copper and Nickel were found in water, but levels were below the water quality standards Table 20 values. No other trace metals were detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25902	South Yamhill River 1231445452258 18.1 to 61.7 43.6	Copper	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 3: Insufficient data	Added to database	2012 Data: [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the hardness dependent criteria

Willamette Yamhill 17090008 7531	South Yamhill River 1231445452258 0 to 18.1 18.1	Cycloate	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7563	South Yamhill River 1231445452258 0 to 18.1 18.1	Desethylatrazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7573	South Yamhill River 1231445452258 0 to 18.1 18.1	Desisoproylatrazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 20969	South Yamhill River 1231445452258 0 to 41 41	Dissolved Oxygen	January 1 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation	Resident trout spawning	Cat 2: Attaining some criteria/uses	Delisted - Data show criteria met	2012 Data: [DEQ] STATION 31547 at RM 5.5 from 02/11/2005 to 02/11/2005, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 10948 at RM 16.7 from 02/16/2000 to 04/05/2011, 2 of 25 (8%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 10949 at RM 27 from 05/14/2009 to 05/14/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation Previous Data: [ODA] LASAR 10948 River Mile 16.7: From 1/24/1994 to 4/29/2003, 8 out of 31 samples (26%) < 11 mg/l and applicable % saturation. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 12156	South Yamhill River 1231445452258 0 to 61.8 61.8	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l	Cool-water aquatic life	Cat 2: Attaining some criteria/uses	No status change	2012 Data: [DEQ] STATION 31547 at RM 5.5 from 08/11/2004 to 07/13/2005, 0 of 3 (0%) samples < 6.5 mg/L. [DEQ] STATION 33885 at RM 14.9 from 09/20/2006 to 09/20/2006, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 10948 at RM 16.7 from 06/26/2000 to 12/07/2011, 0 of 53 (0%) samples < 6.5 mg/L. [DEQ] STATION 36089 at RM 36.7 from 10/21/2009 to 10/21/2009, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 36088 at RM 36.7 from 10/21/2009 to 10/21/2009, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 36087 at RM 36.7 from 10/21/2009 to 10/21/2009, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 35072 at RM 37.4 from 09/20/2011 to 09/20/2011, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 35451 at RM 38.7 from 06/03/2009 to 06/03/2009, 0 of 3 (0%) samples < 6.5 mg/L Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 6/1/1994 to 12/22/2003, 0 out of 54 samples (0%) < 6.5 mg/l and applicable % saturation. Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 25903	South Yamhill River 1231445452258 41 to 61.8 20.8	Dissolved Oxygen	October 15 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation		Cat 3: Insufficient data	Added to database	2012 Data: [DEQ] STATION 36082 at RM 42.7 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36081 at RM 42.7 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36080 at RM 42.8 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36079 at RM 52.5 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36077 at RM 52.5 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36078 at RM 52.5 from 10/20/2009 to 10/20/2009, 1 of 1 (100%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 35450 at RM 54.5 from 05/14/2009 to 05/14/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation
Willamette Yamhill 17090008 7611	South Yamhill River 1231445452258 0 to 18.1 18.1	Diuron	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 17296	South Yamhill River 1231445452258 0 to 18.1 18.1	E. Coli	FallWinterSpring	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/16/1996 to 12/22/2003, 1 out of 43 samples (2%) > 406 organisms; maximum 30-day log mean of 0 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 17297	South Yamhill River 1231445452258 0 to 18.1 18.1	E. Coli	Summer	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/16/1996 to 12/22/2003, 0 out of 19 samples (0%) > 406 organisms; maximum 30-day log mean of 0 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 7632	South Yamhill River 1231445452258 0 to 18.1 18.1	Ethoprop	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6085	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Fecal Coliform	FallWinterSpring	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (2 Sites: 402627, 402628; RM 36.0, 39.5): 20% (3 of 15), 17% (2 of 12) FWS values exceeded fecal coliform standard (400) with maximum values of 460, 1100 respectively between 1986 - 1988. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6878	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Fecal Coliform	Summer	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402627; RM 36.0): 44% (4 of 9) Summer values exceeded fecal coliform standard (400) with a maximum value of 460 between 1986 - 1988. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6087	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Fecal Coliform	FallWinterSpring	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 0% (0 of 12) FWS values exceeded fecal coliform standard (400) between 1986 - 1988. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6086	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Fecal Coliform	Summer	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 40% (2 of 5) Summer values exceeded fecal coliform standard (400) with a maximum value of 460 between 1986 - 1987. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6341	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Flow Modification	Undefined	The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.	Salmonid fish rearing; Resident fish and aquatic life; Salmonid fish spawning	Cat 4C: Water quality limited, not a pollutant	No action	Cutthroat populations are a stock of concern with low flows and high temperatures constraining populations in some coast range streams (ODFW, 92); IWR (59461) is often not met at USGS gage (14194000). Previous Status: Water quality limited not needing a TMDL Previous Action: Delisted - Water quality limited, not a pollutant Previous Assessment Year: 2002
Willamette Yamhill 17090008 6342	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Flow Modification	Undefined	The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.	Salmonid fish spawning; Resident fish and aquatic life; Salmonid fish rearing	Cat 3: Insufficient data	Status modification	Incorrectly assigned Water Quality Limited status in 2002 de-listing action. Status corrected to reflect 1998 assessment status. Previous Status: Water quality limited not needing a TMDL Previous Action: Delisted - Water quality limited, not a pollutant Previous Assessment Year: 2002
Willamette Yamhill 17090008 7652	South Yamhill River 1231445452258 0 to 18.1 18.1	Hexazinone	Year Round	Table 20 Toxic Substances	Drinking water; Resident fish and aquatic life; Anadromous fish passage	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 8384	South Yamhill River 1231445452258 0 to 18.1 18.1	Iron	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed	No status change	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 26 samples from 02/16/2000 to 10/04/2007, 0 of 0 valid samples exceed the 1000 ug/L criteria Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 8/13/2001, 10 out of 69 samples > applicable Table 20 criterion. Previous Data: LASAR 10948 RM 16.8: 2/4 samples > 300 ug/L. Previous Assessment Year: 2002 Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 25896	South Yamhill River 1231445452258 0 to 61.7 61.7	Lead	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 9 samples from 04/15/2008 to 02/17/2010, 2 of 9 valid samples exceed the hardness dependent criteria. [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the hardness dependent criteria
Willamette Yamhill 17090008 17299	South Yamhill River 1231445452258 0 to 61.8 61.8	Manganese	Year Round	Table 20 Toxic Substances	Human health	Cat 3B: Insufficient data, potential concern	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 8/13/2001, 1 out of 69 samples > applicable Table 20 criterion. Previous Status: Cat 3B: Potential concern Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 6796	South Yamhill River 1231445452258 0 to 18.1 18.1	Mercury	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 3B: Insufficient data, potential concern	No action	Previous Data: USGS Data (Site at Hwy 99 Bridge): 1 value detected above standard, a minimum of two exceedences needed to be listed - did not meet listing criteria. Previous Status: Potential concern Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7741	South Yamhill River 1231445452258 0 to 18.1 18.1	Metolachlor	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7754	South Yamhill River 1231445452258 0 to 18.1 18.1	Metribuzin	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Drinking water; Anadromous fish passage	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 7762	South Yamhill River 1231445452258 0 to 18.1 18.1	Napropamide	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7771	South Yamhill River 1231445452258 0 to 18.1 18.1	Nickel	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses	No status change	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 10 samples from 04/15/2008 to 02/17/2010, 0 of 10 valid samples exceed the hardness dependent criteria Previous Data: Copper and Nickel were found in water, but levels were below the water quality standards Table 20 values. No other trace metals were detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6509	South Yamhill River 1231445452258 0 to 18.1 18.1	pH	FallWinterSpring	pH 6.5 to 8.5	Water contact recreation; Salmonid fish spawning; Anadromous fish passage; Resident fish and aquatic life; Salmonid fish rearing	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 12/22/2003, 0 out of 60 samples (0%) outside pH criteria range 6.5 to 8.5. Previous Data: DEQ Data (Site 402625; RM 16.5): 0% (0 of 73) FWS values exceeded pH standard (6.5 - 8.5) between WY 1986 - 1995. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004

Willamette Yamhill 17090008 6877	South Yamhill River 1231445452258 0 to 18.1 18.1	pH	Summer	pH 6.5 to 8.5	Water contact recreation; Salmonid fish spawning; Anadromous fish passage; Resident fish and aquatic life; Salmonid fish rearing	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 6/1/1994 to 8/4/2003, 0 out of 28 samples (0%) outside pH criteria range 6.5 to 8.5. Previous Data: DEQ Data (3 Sites: 402623, 402624, 402625; RM 1.0 - 16.5): 0% (0 of 7, 18, 52) Summer values respectively exceeded pH standard (6.5 - 8.5) between WY 1986 - 1995. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 6510	South Yamhill River 1231445452258 18.1 to 42.6 24.5	pH	FallWinterSpring	pH 6.5 to 8.5	Resident fish and aquatic life; Anadromous fish passage; Salmonid fish rearing; Water contact recreation; Salmonid fish spawning	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (2 Sites: 402627, 402628; RM 36.0, 39.5): 0% (0 of 15, 12) FWS values respectively exceeded pH standard (6.5 -8.5) between 86 - 88. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6879	South Yamhill River 1231445452258 18.1 to 42.6 24.5	pH	Summer	pH 6.5 to 8.5	Salmonid fish spawning; Salmonid fish rearing; Water contact recreation; Resident fish and aquatic life; Anadromous fish passage	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402627; RM 36.0): 0% (0 of 12) Summer values exceeded pH standard (6.5 -8.5) between 1986 - 1988. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6511	South Yamhill River 1231445452258 42.6 to 61.7 19.1	pH	FallWinterSpring	pH 6.5 to 8.5	Salmonid fish spawning; Salmonid fish rearing; Resident fish and aquatic life; Anadromous fish passage; Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 0% (0 of 12) FWS values exceeded pH standard (6.5 - 8.5) between 1986 - 1988. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6881	South Yamhill River 1231445452258 42.6 to 61.7 19.1	pH	Summer	pH 6.5 to 8.5	Resident fish and aquatic life; Salmonid fish rearing; Water contact recreation; Salmonid fish spawning; Anadromous fish passage	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 0% (0 of 5) Summer values exceeded pH standard (6.5 - 8.5) between 1986 - 1987. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 21575	South Yamhill River 1231445452258 0 to 61.8 61.8	Phosphate Phosphorus	Summer	Total phosphates as phosphorus (P): Benchmark 50 ug/L in streams to control excessive aquatic growths	Aquatic life	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ] LASAR 10948 River Mile 16.7: From 6/1/1994 to 8/4/2003, 1 out of 27 samples > 50 ug/L benchmark criterion. Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 6422	South Yamhill River 1231445452258 0 to 18.1 18.1	Phosphorus	May 1 - October 31	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aesthetics	Cat 4A: Water quality limited, TMDL approved	No action	Previous Data: DEQ Data (Site 402625; RM 16.5): 0% (0 of 10) May through October values exceeded phosphorus TMDL standard (70 ug/l) with a maximum value of 60 ug/l between 6/94 - 10/95. Previous Status: TMDL approved Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6423	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Phosphorus	May 1 - October 31	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aesthetics	Cat 4A: Water quality limited, TMDL approved	No action	Previous Data: DEQ Data (Site 402627, RM 36.0): 0% (0 of 19) May through October values exceeded TMDL phosphorus standard (70 ug/l) between 1986 - 1988. Previous Status: TMDL approved Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6424	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Phosphorus	May 1 - October 31	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aesthetics	Cat 4A: Water quality limited, TMDL approved	No action	Previous Data: DEQ Data (Site 402631, RM 53.4): 14% (1 of 7) May through October values exceeded TMDL phosphorus standard (70 ug/l) with a maximum of 110 ug/l between 1986 - 1988. Previous Status: TMDL approved Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6687	South Yamhill River 1231445452258 0 to 18.1 18.1	Sedimentation	Undefined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Resident fish and aquatic life; Salmonid fish spawning; Salmonid fish rearing	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6688	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Sedimentation	Undefined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Salmonid fish rearing; Salmonid fish spawning; Resident fish and aquatic life	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6689	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Sedimentation	Undefined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Salmonid fish spawning; Salmonid fish rearing; Resident fish and aquatic life	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25898	South Yamhill River 1231445452258 0 to 61.7 61.7	Selenium	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 11 samples from 04/15/2008 to 02/17/2010, 0 of 11 valid samples exceed the 35 ug/L criteria. [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the 35 ug/L criteria
Willamette Yamhill 17090008 25894	South Yamhill River 1231445452258 0 to 61.7 61.7	Silver	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 11 samples from 04/15/2008 to 02/17/2010, 0 of 11 valid samples exceed the 0.12 ug/L criteria

Willamette Yamhill 17090008 7890	South Yamhill River 1231445452258 0 to 18.1 18.1	Simazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 5963	South Yamhill River 1231445452258 0 to 18.1 18.1	Temperature	Summer	Rearing: 17.8 C	Salmonid fish rearing; Anadromous fish passage	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402625; RM 16.5): 88% (46 of 52) Summer values exceeded temperature standard (64) with exceedances each year and a maximum of 81.5 in WY 1986 - 1995. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 5964	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Temperature	Summer	Rearing: 17.8 C	Anadromous fish passage; Salmonid fish rearing	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402627; RM 36): 75% (9 of 12) Summer values exceeded temperature standard (64) with exceedances each year and a maximum of 75.9 in WY 1986 - 1988. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 5965	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Temperature	Undefined		Salmonid fish rearing; Resident fish and aquatic life; Anadromous fish passage; Salmonid fish spawning	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 25900	South Yamhill River 1231445452258 0 to 61.7 61.7	Zinc	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 3B: Insufficient data, potential concern	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 9 samples from 04/15/2008 to 02/17/2010, 1 of 9 valid samples exceed the hardness dependent criteria. [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the hardness dependent criteria

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Contact

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Basin Name Subbasin 4th Field HUC Record ID	Water Body LLID River Miles Segment Miles Beach Name Beach ID	Pollutant	Season	Criteria	Beneficial Uses	Status	2012 Assessment Action	[Data Source] Supporting Data
Willamette Yamhill 17090008 17303	North Yamhill River 1231445452259 0 to 32.5 32.5	Alkalinity	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 3B: Insufficient data, potential concern	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10649 River Mile 15: From 1/24/1996 to 7/18/2001, 0 out of 3 samples < 20 mg/L (Table 20 criterion). [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 1/24/1994 to 12/22/2003, 3 out of 82 samples < 20 mg/L (Table 20 criterion). Previous Status: Cat 3B: Potential concern Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 17304	North Yamhill River 1231445452259 0 to 32.5 32.5	Ammonia	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10649 River Mile 15: From 1/24/1996 to 7/18/2001, 0 out of 4 samples > applicable Table 20 criterion. [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 1/24/1994 to 12/22/2003, 0 out of 116 samples > applicable Table 20 criterion. Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 25479	North Yamhill River 1231445452259 0 to 32.4 32.4	Arsenic	Year Round	Table 40 Human Health Criteria for Toxic Pollutants	Human health; Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 33921 at RM 0.8 for 1 samples from 09/21/2006 to 09/21/2006, 0 of 1 valid samples exceed the 2.1 ug/L criteria. [ODEQ] STATION 10929 at RM 4.4 for 20 samples from 04/15/2008 to 02/17/2010, 0 of 20 valid samples exceed the 2.1 ug/L criteria. [ODEQ] STATION 33891 at RM 14.5 for 2 samples from 09/14/2006 to 09/14/2006, 0 of 2 valid samples exceed the 2.1 ug/L criteria
Willamette Yamhill 17090008 7305	North Yamhill River 1231445452259 0 to 20.1 20.1	Atrazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, simazine and Terbacil were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 24075	North Yamhill River 1231445452259 0 to 32.4 32.4	Biological Criteria	Year Round	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	2010 Data: EPA addition to 303(d) list 12/14/2012: LASAR 33921 River Mile 0.8 FROM 9/21/2006 To 9/21/2006 1 out of 1 (100%) samples outside MWCF regional criteria. LASAR 33891 River Mile 14.46 FROM 9/14/2006 To 9/14/2006 1 out of 1 (100%) samples outside MWCF regional criteria. LASAR 30942 River Mile 19.9 FROM 9/10/2003 To 9/10/2003 1 out of 1 (100%) samples outside MWCF regional criteria. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: Status modification - EPA addition to 303(d) list Previous Assessment Year: 2010
Willamette Yamhill 17090008 25482	North Yamhill River 1231445452259 0 to 32.4 32.4	Cadmium	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 20 samples from 04/15/2008 to 02/17/2010, 0 of 20 valid samples exceed the hardness dependent criteria

Willamette Yamhill 17090008 17305	North Yamhill River 1231445452259 0 to 20.1 20.1	Chlorophyll a	FallWinterSpring	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Water contact recreation; Aesthetics; Water supply; Fishing; Livestock watering	Cat 3: Insufficient data	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 5/23/1995 to 5/31/1995, average Chlorophyll a of 0.012 for 1 samples in 1 months. Previous Status: Cat 3: Insufficient data Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 6248	North Yamhill River 1231445452259 0 to 20.1 20.1	Chlorophyll a	Summer	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Fishing; Water supply; Water contact recreation; Aesthetics; Livestock watering	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 6/10/1996 to 9/7/1996, average Chlorophyll a of 0.013 for 3 samples in 3 months. [DEQ] LASAR 10649 River Mile 15: From 7/18/2001 to 9/30/2001, average Chlorophyll a of 0.005 for 1 samples in 1 months. Previous Data: DEQ Data (3 Sites: 402605, 402606, 402607; RM 1.5 - 10.0): 0% (0 of 7); 14% (6 of 42); 5% (1 of 20) Summer values respectively exceeded chlorophyll a standard (15 ug/l) with maximum values of 51, 18 between 1986 - 1995. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 25481	North Yamhill River 1231445452259 0 to 32.4 32.4	Chlorpyrifos	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 3: Insufficient data	Added to database	2012 Data: [USGS] STATION 452149123194900 at RM 25.5 for 2 samples from 05/18/2004 to 08/27/2004, 0 of 2 valid samples exceed the 0.041 ug/L criteria
Willamette Yamhill 17090008 25473	North Yamhill River 1231445452259 0 to 32.4 32.4	Chromium	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 16 samples from 04/15/2008 to 02/17/2010, 0 of 16 valid samples exceed the 11 ug/L criteria
Willamette Yamhill 17090008 25474	North Yamhill River 1231445452259 0 to 32.4 32.4	Copper	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 5: Water quality limited, 303(d) list, TMDL needed	Added to database	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 18 samples from 04/15/2008 to 02/17/2010, 2 of 18 valid samples exceed the hardness dependent criteria

Willamette Yamhill 17090008 7530	North Yamhill River 1231445452259 0 to 20.1 20.1	Cycloate	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, simazine and Terbacil were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 21958	North Yamhill River 1231445452259 0 to 14 14	Dissolved Oxygen	January 1 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation	Resident trout spawning	Cat 5: Water quality limited, 303(d) list, TMDL needed	No status change	2012 Data: [DEQ] STATION 10929 at RM 4.4 from 02/16/2000 to 02/17/2010, 5 of 19 (26%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 34039 at RM 9.4 from 03/16/2007 to 04/27/2010, 13 of 22 (59%) samples < 11.0 mg/l and < 95% saturation Previous Data: DEQ] LASAR 10929 River Mile 4.4: From 1/24/1994 to 4/29/2003, 11 out of 31 samples (35%) < 11 mg/L and applicable % saturation. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 12157	North Yamhill River 1231445452259 0 to 20.1 20.1	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l	Cool-water aquatic life	Cat 2: Attaining some criteria/uses	Status modification - Attaining criteria/uses	Segment modified to reflect current application of cool water criterion. Cool water criterion previously applied from RM 0 to 28.5. Current data show attainment of criterion. 2012 Data: [DEQ] STATION 33921 at RM 0.8 from 09/21/2006 to 09/21/2006, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 10929 at RM 4.4 from 06/26/2000 to 12/07/2011, 1 of 53 (2%) samples < 6.5 mg/L. [DEQ] STATION 35165 at RM 8.6 from 10/16/2008 to 10/16/2008, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 35166 at RM 8.6 from 10/16/2008 to 10/16/2008, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 35164 at RM 8.6 from 10/16/2008 to 10/16/2008, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 34039 at RM 9.4 from 05/25/2007 to 05/26/2010, 0 of 14 (0%) samples < 6.5 mg/L. [DEQ] STATION 34036 at RM 13.2 from 05/31/2005 to 10/30/2006, 0 of 10 (0%) samples < 6.5 mg/L. [DEQ] STATION 35163 at RM 14 from 10/16/2008 to 10/16/2008, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 35161 at RM 14 from 10/16/2008 to 10/16/2008, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 10649 at RM 15 from 07/18/2001 to 07/18/2001, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 34035 at RM 15.8 from 05/31/2005 to 08/11/2011, 0 of 11 (0%) samples < 6.5 mg/L. [DEQ] STATION 30942 at RM 19.9 from 05/31/2005 to 09/30/2006, 0 of 8 (0%) samples < 6.5 mg/L Previous Data: [DEQ/ODA - Salem] LASAR 10649 River Mile 15: From 7/18/2001 to 7/18/2001, 0 out of 1 samples (0%) < 6.5 mg/l and applicable % saturation. Previous Status: Cat 3: Insufficient data Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 12485	North Yamhill River 1231445452259 14 to 30.7 16.7	Dissolved Oxygen	October 15 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation	Salmon and steelhead spawning	Cat 3: Insufficient data	No status change	2012 Data: [DEQ] STATION 34035 at RM 15.8 from 10/26/2005 to 10/29/2006, 2 of 2 (100%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 30942 at RM 19.9 from 10/26/2005 to 10/29/2006, 1 of 2 (50%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 35448 at RM 20.2 from 05/13/2009 to 05/13/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation Previous Data: [DEQ/ODA - Salem] LASAR 10649 River Mile 15: From 1/24/1996 to 1/24/1996, 1 out of 1 samples (100%) < 11 mg/l and applicable % saturation. Previous Status: Cat 3: Insufficient data Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 24883	North Yamhill River 1231445452259 20.1 to 32.4 12.3	Dissolved Oxygen	Year Round (Non-spawning)	Cold water: Not less than 8.0 mg/l or 90% of saturation	Cold-water aquatic life	Cat 3: Insufficient data	Added to database	Current application of cold water criterion to this segment. 2012 Data: [USGS] STATION 452149123194900 at RM 25.5 from 05/18/2004 to 08/27/2004, 0 of 2 (0%) samples < 8.0 mg/l and < 90% saturation
Willamette Yamhill 17090008 17307	North Yamhill River 1231445452259 0 to 20.1 20.1	E. Coli	FallWinterSpring	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: [ODA] LASAR 10649 River Mile 15: From 1/24/1996 to 1/24/1996, 0 out of 1 samples (0%) > 406 organisms; maximum 30-day log mean of 0 [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 1/16/1996 to 12/22/2003, 5 out of 41 samples (12%) > 406 organisms; maximum 30-day log mean of 0 Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 17308	North Yamhill River 1231445452259 0 to 20.1 20.1	E. Coli	Summer	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 1/16/1996 to 12/22/2003, 1 out of 18 samples (6%) > 406 organisms; maximum 30-day log mean of 0 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 24582	North Yamhill River 1231445452259 12.3 to 32.4 20.1	E. Coli	Summer	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	2010 Data: EPA addition to 303(d) list 12/14/2012: Two exceedences of the 406 maximum criteria out of 9 days of sampling at LASAR station 34035, North Yamhill River at bridge on Moores Valley Road (North Yamhill), between 8/16/05 and 9/12/06; the geometic mean criteria is also exceeded at this station between 8/26/03 and 9/24/03 and between 8/25/04 and between 8/15/06 and 9/12/06. Two exceedences of the 406 maximum criteria out of 17 days of sampling at LASAR station 30942, North Yamhill River below Turner Creek, between 8/26/03 and 9/12/06. Exceedence of thegeometric mean criteria at LASAR station 34036, North Yamhill River downstream of Yamhill Creek (North Yamhill), between 8/15/06 and 9/12/05. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: EPA addition to 303(d) list Previous Assessment Year: 2010
Willamette Yamhill 17090008 6081	North Yamhill River 1231445452259 0 to 20.1 20.1	Fecal Coliform	FallWinterSpring	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (2 Sites: 402605, 402606; RM 1.5, 4.5): 30% (6 of 20), 40% (21 of 53) FWS values respectively exceeded fecal coliform standard (400) with maximum values of 2400, 2400 between WY 1986 - 1995. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6082	North Yamhill River 1231445452259 20.1 to 32.4 12.3	Fecal Coliform	Undefined		Water contact recreation	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6340	North Yamhill River 1231445452259 0 to 20.1 20.1	Flow Modification	Undefined	The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.	Resident fish and aquatic life; Salmonid fish rearing; Salmonid fish spawning	Cat 4C: Water quality limited, not a pollutant	No action	Cutthroat populations are a stock of concern with low flows and high temperatures constraining populations in some coast range streams (ODFW, 92); IWR (70746) is often not met at USGS gage (14197000). Previous Status: Water quality limited not needing a TMDL Previous Action: Delisted - Water quality limited, not a pollutant Previous Assessment Year: 2002

Willamette Yamhill 17090008 17309	North Yamhill River 1231445452259 0 to 32.5 32.5	Iron	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed	No status change	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 33 samples from 02/16/2000 to 10/04/2007, 0 of 0 valid samples exceed the 1000 ug/L criteria Previous Data: [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 1/24/1994 to 8/13/2001, 12 out of 63 samples > applicable Table 20 criterion. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 25477	North Yamhill River 1231445452259 0 to 32.4 32.4	Lead	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 3B: Insufficient data, potential concern	Added to database	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 14 samples from 04/15/2008 to 02/17/2010, 1 of 14 valid samples exceed the hardness dependent criteria
Willamette Yamhill 17090008 25471	North Yamhill River 1231445452259 0 to 32.4 32.4	Malathion	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 3: Insufficient data	Added to database	2012 Data: [USGS] STATION 452149123194900 at RM 25.5 for 2 samples from 05/18/2004 to 08/27/2004, 0 of 2 valid samples exceed the 0.1 ug/L criteria
Willamette Yamhill 17090008 17310	North Yamhill River 1231445452259 0 to 32.5 32.5	Manganese	Year Round	Table 20 Toxic Substances	Human health	No criteria	Delisted - Criteria change or use clarification	The freshwater manganese criterion has been withdrawn Previous Data: [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 1/24/1994 to 8/13/2001, 3 out of 63 samples > applicable Table 20 criterion. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 25475	North Yamhill River 1231445452259 0 to 32.4 32.4	Nickel	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 16 samples from 04/15/2008 to 02/17/2010, 0 of 16 valid samples exceed the hardness dependent criteria
Willamette Yamhill 17090008 6421	North Yamhill River 1231445452259 20.1 to 32.4 12.3	Nutrients	Undefined		Aesthetics	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6508	North Yamhill River 1231445452259 0 to 20.1 20.1	pH	FallWinterSpring	pH 6.5 to 8.5	Salmonid fish rearing; Resident fish and aquatic life; Anadromous fish passage; Water contact recreation; Salmonid fish spawning	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10649 River Mile 15: From 1/24/1996 to 1/24/1996, 0 out of 1 samples (0%) outside pH criteria range 6.5 to 8.5. [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 1/24/1994 to 12/22/2003, 0 out of 56 samples (0%) outside pH criteria range 6.5 to 8.5. Previous Data: DEQ Data (2 Sites: 402605, 402606; RM 1.5, 4.5): 0% (0 of 20, 53) FWS values respectively exceeded pH standard (6.5 - 8.5) between WY 1986 - 1995. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 6875	North Yamhill River 1231445452259 0 to 20.1 20.1	pH	Summer	pH 6.5 to 8.5	Water contact recreation; Resident fish and aquatic life; Anadromous fish passage; Salmonid fish rearing; Salmonid fish spawning	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10649 River Mile 15: From 7/18/2001 to 7/18/2001, 0 out of 1 samples (0%) outside pH criteria range 6.5 to 8.5. [DEQ/ODA - Salem] LASAR 10929 River Mile 4.4: From 8/29/1994 to 8/4/2003, 0 out of 25 samples (0%) outside pH criteria range 6.5 to 8.5. Previous Data: DEQ Data (3 Sites: 402605, 402606, 402607; RM 1.5 - 10.0): 0% (0 of 6, 43, 20) Summer values respectively exceeded pH standard (6.5 - 8.5) between WY 1986 - 1995. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 21576	North Yamhill River 1231445452259 0 to 32.5 32.5	Phosphate Phosphorus	Summer	Total phosphates as phosphorus (P): Benchmark 50 ug/L in streams to control excessive aquatic growths	Aquatic life	Cat 3B: Insufficient data, potential concern	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10649 River Mile 15: From 7/18/2001 to 7/18/2001, 1 out of 1 samples > 50 ug/L benchmark criterion. [DEQ] LASAR 10929 River Mile 4.4: From 8/29/1994 to 8/4/2003, 3 out of 24 samples > 50 ug/L benchmark criterion. Previous Status: Cat 3B: Potential concern Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 6420	North Yamhill River 1231445452259 0 to 20.1 20.1	Phosphorus	May 1 - October 31	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aesthetics	Cat 4A: Water quality limited, TMDL approved	No action	Previous Data: DEQ Data (Site 402606; RM 4.5): 0% (0 of 10) May through October values exceeded phosphorus TMDL standard (70 ug/l) with a maximum value of 60 ug/l between 6/94 - 10/95. Previous Status: TMDL approved Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6686	North Yamhill River 1231445452259 0 to 20.1 20.1	Sedimentation	Undefined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Salmonid fish spawning; Resident fish and aquatic life; Salmonid fish rearing	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25478	North Yamhill River 1231445452259 0 to 32.4 32.4	Selenium	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 20 samples from 04/15/2008 to 02/17/2010, 0 of 20 valid samples exceed the 35 ug/L criteria
Willamette Yamhill 17090008 25476	North Yamhill River 1231445452259 0 to 32.4 32.4	Silver	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 20 samples from 04/15/2008 to 02/17/2010, 0 of 20 valid samples exceed the 0.12 ug/L criteria
Willamette Yamhill 17090008 7889	North Yamhill River 1231445452259 0 to 20.1 20.1	Simazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, simazine and Terbacil were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 5962	North Yamhill River 1231445452259 0 to 20.1 20.1	Temperature	Summer	Rearing: 17.8 C	Salmonid fish rearing; Anadromous fish passage	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402606; RM 4.5): 77% (33 of 43) Summer values exceeded temperature standard (64) with exceedances each year and a maximum of 78.8 in WY 1986 - 1995. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 7136	North Yamhill River 1231445452259 20.1 to 32.4 12.3	Temperature	Summer	Rearing: 17.8 C	Anadromous fish passage; Salmonid fish rearing	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: Two BLM sites: RM 20 and 27 in 1995, 7 day aver. max. temperature was 71.9/64.4°F, both sites exceeded temperature standard (64 °F) Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7910	North Yamhill River 1231445452259 0 to 20.1 20.1	Terbacil	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, simazine and Terbacil were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25480	North Yamhill River 1231445452259 0 to 32.4 32.4	Zinc	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10929 at RM 4.4 for 13 samples from 04/15/2008 to 02/17/2010, 0 of 13 valid samples exceed the hardness dependent criteria
Willamette Yamhill 17090008 17292	South Yamhill River 1231445452258 0 to 61.8 61.8	Alkalinity	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 3B: Insufficient data, potential concern	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 12/22/2003, 11 out of 88 samples < 20 mg/L (Table 20 criterion). Previous Status: Cat 3B: Potential concern Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 17293	South Yamhill River 1231445452258 0 to 61.8 61.8	Ammonia	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 12/22/2003, 0 out of 136 samples > applicable Table 20 criterion. Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 25897	South Yamhill River 1231445452258 0 to 61.7 61.7	Arsenic	Year Round	Table 40 Human Health Criteria for Toxic Pollutants	Human health; Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 33885 at RM 14.9 for 1 samples from 09/20/2006 to 09/20/2006, 0 of 1 valid samples exceed the 2.1 ug/L criteria. [ODEQ] STATION 10948 at RM 16.7 for 11 samples from 04/15/2008 to 02/17/2010, 0 of 11 valid samples exceed the 2.1 ug/L criteria. [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the 2.1 ug/L criteria
Willamette Yamhill 17090008 7304	South Yamhill River 1231445452258 0 to 18.1 18.1	Atrazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25901	South Yamhill River 1231445452258 0 to 61.7 61.7	Cadmium	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 11 samples from 04/15/2008 to 02/17/2010, 0 of 11 valid samples exceed the hardness dependent criteria
Willamette Yamhill 17090008 17294	South Yamhill River 1231445452258 0 to 18.1 18.1	Chlorophyll a	FallWinterSpring	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Aesthetics; Livestock watering; Water supply; Water contact recreation; Fishing	Cat 3: Insufficient data	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 5/23/1995 to 5/31/1995, average Chlorophyll a of 0.012 for 1 samples in 1 months. Previous Status: Cat 3: Insufficient data Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 6249	South Yamhill River 1231445452258 0 to 18.1 18.1	Chlorophyll a	Summer	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Fishing; Aesthetics; Livestock watering; Water contact recreation; Water supply	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 7/2/1996 to 9/29/1996, average Chlorophyll a of 0.005 for 3 samples in 3 months. Previous Data: DEQ Data (3 Sites: 402623, 402624, 402625; RM 1.0 - 16.5): 29% (2 of 7), 0% (0 of 19, 50) Summer values respectively exceeded chlorophyll a standard (15 ug/l) with a maximum value of 20 between WY 1986 - 1995. Did not meet "Minimum Data Requirements", data did not exceed the 3-month average criteria. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 6880	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Chlorophyll a	Summer	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Water contact recreation; Water supply; Aesthetics; Livestock watering; Fishing	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402627; RM 36.0): 0% (0 of 13) Summer values exceeded chlorophyll a standard (15 ug/l) between 1986 - 1988. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6882	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Chlorophyll a	Summer	Reservoir, river, estuary, non-thermally stratified lake: 0.015 mg/l	Water contact recreation; Aesthetics; Livestock watering; Water supply; Fishing	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 0% (0 of 5) Summer values exceeded chlorophyll a standard (15 ug/l) between 1986 - 1987. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25895	South Yamhill River 1231445452258 0 to 61.7 61.7	Chromium	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 9 samples from 04/15/2008 to 02/17/2010, 0 of 9 valid samples exceed the 11 ug/L criteria

Willamette Yamhill 17090008 7146	South Yamhill River 1231445452258 0 to 18.1 18.1	Copper	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 5: Water quality limited, 303(d) list, TMDL needed	Status modification - Added to 303(d) list	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 10 samples from 04/15/2008 to 02/17/2010, 4 of 10 valid samples exceed the hardness dependent criteria Previous Data: Copper and Nickel were found in water, but levels were below the water quality standards Table 20 values. No other trace metals were detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25902	South Yamhill River 1231445452258 18.1 to 61.7 43.6	Copper	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 3: Insufficient data	Added to database	2012 Data: [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the hardness dependent criteria
Willamette Yamhill 17090008 7531	South Yamhill River 1231445452258 0 to 18.1 18.1	Cycloate	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7563	South Yamhill River 1231445452258 0 to 18.1 18.1	Desethylatrazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 7573	South Yamhill River 1231445452258 0 to 18.1 18.1	Desisoproylatrazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 20969	South Yamhill River 1231445452258 0 to 41 41	Dissolved Oxygen	January 1 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation	Resident trout spawning	Cat 2: Attaining some criteria/uses	Delisted - Data show criteria met	2012 Data: [DEQ] STATION 31547 at RM 5.5 from 02/11/2005 to 02/11/2005, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 10948 at RM 16.7 from 02/16/2000 to 04/05/2011, 2 of 25 (8%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 10949 at RM 27 from 05/14/2009 to 05/14/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation Previous Data: [ODA] LASAR 10948 River Mile 16.7: From 1/24/1994 to 4/29/2003, 8 out of 31 samples (26%) < 11 mg/l and applicable % saturation. Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 12156	South Yamhill River 1231445452258 0 to 61.8 61.8	Dissolved Oxygen	Year Round (Non-spawning)	Cool water: Not less than 6.5 mg/l	Cool-water aquatic life	Cat 2: Attaining some criteria/uses	No status change	2012 Data: [DEQ] STATION 31547 at RM 5.5 from 08/11/2004 to 07/13/2005, 0 of 3 (0%) samples < 6.5 mg/L. [DEQ] STATION 33885 at RM 14.9 from 09/20/2006 to 09/20/2006, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 10948 at RM 16.7 from 06/26/2000 to 12/07/2011, 0 of 53 (0%) samples < 6.5 mg/L. [DEQ] STATION 36089 at RM 36.7 from 10/21/2009 to 10/21/2009, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 36088 at RM 36.7 from 10/21/2009 to 10/21/2009, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 36087 at RM 36.7 from 10/21/2009 to 10/21/2009, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 35072 at RM 37.4 from 09/20/2011 to 09/20/2011, 0 of 1 (0%) samples < 6.5 mg/L. [DEQ] STATION 35451 at RM 38.7 from 06/03/2009 to 06/03/2009, 0 of 3 (0%) samples < 6.5 mg/L Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 6/1/1994 to 12/22/2003, 0 out of 54 samples (0%) < 6.5 mg/l and applicable % saturation. Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 25903	South Yamhill River 1231445452258 41 to 61.8 20.8	Dissolved Oxygen	October 15 - May 15	Spawning: Not less than 11.0 mg/L or 95% of saturation		Cat 3: Insufficient data	Added to database	2012 Data: [DEQ] STATION 36082 at RM 42.7 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36081 at RM 42.7 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36080 at RM 42.8 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36079 at RM 52.5 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36077 at RM 52.5 from 10/20/2009 to 10/20/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 36078 at RM 52.5 from 10/20/2009 to 10/20/2009, 1 of 1 (100%) samples < 11.0 mg/l and < 95% saturation. [DEQ] STATION 35450 at RM 54.5 from 05/14/2009 to 05/14/2009, 0 of 1 (0%) samples < 11.0 mg/l and < 95% saturation
Willamette Yamhill 17090008 7611	South Yamhill River 1231445452258 0 to 18.1 18.1	Diuron	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 17296	South Yamhill River 1231445452258 0 to 18.1 18.1	E. Coli	FallWinterSpring	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/16/1996 to 12/22/2003, 1 out of 43 samples (2%) > 406 organisms; maximum 30-day log mean of 0 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004

Willamette Yamhill 17090008 17297	South Yamhill River 1231445452258 0 to 18.1 18.1	E. Coli	Summer	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/16/1996 to 12/22/2003, 0 out of 19 samples (0%) > 406 organisms; maximum 30-day log mean of 0 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 7632	South Yamhill River 1231445452258 0 to 18.1 18.1	Ethoprop	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6085	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Fecal Coliform	FallWinterSpring	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (2 Sites: 402627, 402628; RM 36.0, 39.5): 20% (3 of 15), 17% (2 of 12) FWS values exceeded fecal coliform standard (400) with maximum values of 460, 1100 respectively between 1986 - 1988. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6878	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Fecal Coliform	Summer	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402627; RM 36.0): 44% (4 of 9) Summer values exceeded fecal coliform standard (400) with a maximum value of 460 between 1986 - 1988. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6087	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Fecal Coliform	FallWinterSpring	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 0% (0 of 12) FWS values exceeded fecal coliform standard (400) between 1986 - 1988. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6086	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Fecal Coliform	Summer	Fecal coliform log mean of 200 organisms per 100 ml; no more than 10% > 400 per 100 ml	Water contact recreation	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 40% (2 of 5) Summer values exceeded fecal coliform standard (400) with a maximum value of 460 between 1986 - 1987. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6341	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Flow Modification	Undefined	The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.	Salmonid fish rearing; Resident fish and aquatic life; Salmonid fish spawning	Cat 4C: Water quality limited, not a pollutant	No action	Cutthroat populations are a stock of concern with low flows and high temperatures constraining populations in some coast range streams (ODFW, 92); IWR (59461) is often not met at USGS gage (14194000). Previous Status: Water quality limited not needing a TMDL Previous Action: Delisted - Water quality limited, not a pollutant Previous Assessment Year: 2002
Willamette Yamhill 17090008 6342	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Flow Modification	Undefined	The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.	Salmonid fish spawning; Resident fish and aquatic life; Salmonid fish rearing	Cat 3: Insufficient data	Status modification	Incorrectly assigned Water Quality Limited status in 2002 de-listing action. Status corrected to reflect 1998 assessment status. Previous Status: Water quality limited not needing a TMDL Previous Action: Delisted - Water quality limited, not a pollutant Previous Assessment Year: 2002
Willamette Yamhill 17090008 7652	South Yamhill River 1231445452258 0 to 18.1 18.1	Hexazinone	Year Round	Table 20 Toxic Substances	Drinking water; Resident fish and aquatic life; Anadromous fish passage	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 8384	South Yamhill River 1231445452258 0 to 18.1 18.1	Iron	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed	No status change	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 26 samples from 02/16/2000 to 10/04/2007, 0 of 0 valid samples exceed the 1000 ug/L criteria Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 8/13/2001, 10 out of 69 samples > applicable Table 20 criterion. Previous Data: LASAR 10948 RM 16.8: 2/4 samples > 300 ug/L. Previous Assessment Year: 2002 Previous Status: Cat 5: Water quality limited, 303(d) list, TMDL needed Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 25896	South Yamhill River 1231445452258 0 to 61.7 61.7	Lead	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 5: Water quality limited, 303(d) list, TMDL needed	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 9 samples from 04/15/2008 to 02/17/2010, 2 of 9 valid samples exceed the hardness dependent criteria. [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the hardness dependent criteria
Willamette Yamhill 17090008 17299	South Yamhill River 1231445452258 0 to 61.8 61.8	Manganese	Year Round	Table 20 Toxic Substances	Human health	Cat 3B: Insufficient data, potential concern	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 8/13/2001, 1 out of 69 samples > applicable Table 20 criterion. Previous Status: Cat 3B: Potential concern Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 6796	South Yamhill River 1231445452258 0 to 18.1 18.1	Mercury	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 3B: Insufficient data, potential concern	No action	Previous Data: USGS Data (Site at Hwy 99 Bridge): 1 value detected above standard, a minimum of two exceedences needed to be listed - did not meet listing criteria. Previous Status: Potential concern Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 7741	South Yamhill River 1231445452258 0 to 18.1 18.1	Metolachlor	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7754	South Yamhill River 1231445452258 0 to 18.1 18.1	Metribuzin	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Drinking water; Anadromous fish passage	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7762	South Yamhill River 1231445452258 0 to 18.1 18.1	Napropamide	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 7771	South Yamhill River 1231445452258 0 to 18.1 18.1	Nickel	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses	No status change	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 10 samples from 04/15/2008 to 02/17/2010, 0 of 10 valid samples exceed the hardness dependent criteria Previous Data: Copper and Nickel were found in water, but levels were below the water quality standards Table 20 values. No other trace metals were detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6509	South Yamhill River 1231445452258 0 to 18.1 18.1	pH	FallWinterSpring	pH 6.5 to 8.5	Water contact recreation; Salmonid fish spawning; Anadromous fish passage; Resident fish and aquatic life; Salmonid fish rearing	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 1/24/1994 to 12/22/2003, 0 out of 60 samples (0%) outside pH criteria range 6.5 to 8.5. Previous Data: DEQ Data (Site 402625; RM 16.5): 0% (0 of 73) FWS values exceeded pH standard (6.5 - 8.5) between WY 1986 - 1995. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 6877	South Yamhill River 1231445452258 0 to 18.1 18.1	pH	Summer	pH 6.5 to 8.5	Water contact recreation; Salmonid fish spawning; Anadromous fish passage; Resident fish and aquatic life; Salmonid fish rearing	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10948 River Mile 16.7: From 6/1/1994 to 8/4/2003, 0 out of 28 samples (0%) outside pH criteria range 6.5 to 8.5. Previous Data: DEQ Data (3 Sites: 402623, 402624, 402625; RM 1.0 - 16.5): 0% (0 of 7, 18, 52) Summer values respectively exceeded pH standard (6.5 - 8.5) between WY 1986 - 1995. Previous Assessment Year: 1998 Previous Status: Cat 2: Attaining some criteria/uses Previous Action: No status change Previous Assessment Year: 2004
Willamette Yamhill 17090008 6510	South Yamhill River 1231445452258 18.1 to 42.6 24.5	pH	FallWinterSpring	pH 6.5 to 8.5	Resident fish and aquatic life; Anadromous fish passage; Salmonid fish rearing; Water contact recreation; Salmonid fish spawning	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (2 Sites: 402627, 402628; RM 36.0, 39.5): 0% (0 of 15, 12) FWS values respectively exceeded pH standard (6.5 -8.5) between 86 - 88. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6879	South Yamhill River 1231445452258 18.1 to 42.6 24.5	pH	Summer	pH 6.5 to 8.5	Salmonid fish spawning; Salmonid fish rearing; Water contact recreation; Resident fish and aquatic life; Anadromous fish passage	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402627; RM 36.0): 0% (0 of 12) Summer values exceeded pH standard (6.5 -8.5) between 1986 - 1988. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6511	South Yamhill River 1231445452258 42.6 to 61.7 19.1	pH	FallWinterSpring	pH 6.5 to 8.5	Salmonid fish spawning; Salmonid fish rearing; Resident fish and aquatic life; Anadromous fish passage; Water contact recreation	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 0% (0 of 12) FWS values exceeded pH standard (6.5 - 8.5) between 1986 - 1988. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6881	South Yamhill River 1231445452258 42.6 to 61.7 19.1	pH	Summer	pH 6.5 to 8.5	Resident fish and aquatic life; Salmonid fish rearing; Water contact recreation; Salmonid fish spawning; Anadromous fish passage	Cat 2: Attaining some criteria/uses	No action	Previous Data: DEQ Data (Site 402631; RM 53.4): 0% (0 of 5) Summer values exceeded pH standard (6.5 - 8.5) between 1986 - 1987. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 21575	South Yamhill River 1231445452258 0 to 61.8 61.8	Phosphate Phosphorus	Summer	Total phosphates as phosphorus (P): Benchmark 50 ug/L in streams to control excessive aquatic growths	Aquatic life	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ] LASAR 10948 River Mile 16.7: From 6/1/1994 to 8/4/2003, 1 out of 27 samples > 50 ug/L benchmark criterion. Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 6422	South Yamhill River 1231445452258 0 to 18.1 18.1	Phosphorus	May 1 - October 31	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aesthetics	Cat 4A: Water quality limited, TMDL approved	No action	Previous Data: DEQ Data (Site 402625; RM 16.5): 0% (0 of 10) May through October values exceeded phosphorus TMDL standard (70 ug/l) with a maximum value of 60 ug/l between 6/94 - 10/95. Previous Status: TMDL approved Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6423	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Phosphorus	May 1 - October 31	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aesthetics	Cat 4A: Water quality limited, TMDL approved	No action	Previous Data: DEQ Data (Site 402627, RM 36.0): 0% (0 of 19) May through October values exceeded TMDL phosphorus standard (70 ug/l) between 1986 - 1988. Previous Status: TMDL approved Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6424	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Phosphorus	May 1 - October 31	Biocriteria: Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Aesthetics	Cat 4A: Water quality limited, TMDL approved	No action	Previous Data: DEQ Data (Site 402631, RM 53.4): 14% (1 of 7) May through October values exceeded TMDL phosphorus standard (70 ug/l) with a maximum of 110 ug/l between 1986 - 1988. Previous Status: TMDL approved Previous Action: Added to database Previous Assessment Year: 1998

Willamette Yamhill 17090008 6687	South Yamhill River 1231445452258 0 to 18.1 18.1	Sedimentation	Undefined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Resident fish and aquatic life; Salmonid fish spawning; Salmonid fish rearing	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6688	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Sedimentation	Undefined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Salmonid fish rearing; Salmonid fish spawning; Resident fish and aquatic life	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 6689	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Sedimentation	Undefined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Salmonid fish spawning; Salmonid fish rearing; Resident fish and aquatic life	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25898	South Yamhill River 1231445452258 0 to 61.7 61.7	Selenium	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 11 samples from 04/15/2008 to 02/17/2010, 0 of 11 valid samples exceed the 35 ug/L criteria. [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the 35 ug/L criteria
Willamette Yamhill 17090008 25894	South Yamhill River 1231445452258 0 to 61.7 61.7	Silver	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 11 samples from 04/15/2008 to 02/17/2010, 0 of 11 valid samples exceed the 0.12 ug/L criteria

Willamette Yamhill 17090008 7890	South Yamhill River 1231445452258 0 to 18.1 18.1	Simazine	Year Round	Table 20 Toxic Substances	Resident fish and aquatic life; Anadromous fish passage; Drinking water	Cat 2: Attaining some criteria/uses	No action	Previous Data: Atrazine, Cycloate, Desethylatrazine, Desisoproylatrazine, Diuron, Ethoprop, Hexazinone, Metolachlor, Metribuzin, Napropamide and Simazine were found but either do not have or were below any water quality standard, guidance level or criteria. No other pesticides detected. Previous Status: Attaining Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 5963	South Yamhill River 1231445452258 0 to 18.1 18.1	Temperature	Summer	Rearing: 17.8 C	Salmonid fish rearing; Anadromous fish passage	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402625; RM 16.5): 88% (46 of 52) Summer values exceeded temperature standard (64) with exceedances each year and a maximum of 81.5 in WY 1986 - 1995. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 5964	South Yamhill River 1231445452258 18.1 to 42.6 24.5	Temperature	Summer	Rearing: 17.8 C	Anadromous fish passage; Salmonid fish rearing	Cat 5: Water quality limited, 303(d) list, TMDL needed	No action	Previous Data: DEQ Data (Site 402627; RM 36): 75% (9 of 12) Summer values exceeded temperature standard (64) with exceedances each year and a maximum of 75.9 in WY 1986 - 1988. Previous Status: 303(d) Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 5965	South Yamhill River 1231445452258 42.6 to 61.7 19.1	Temperature	Undefined		Salmonid fish rearing; Resident fish and aquatic life; Anadromous fish passage; Salmonid fish spawning	Cat 3: Insufficient data	No action	Previous Status: Insufficient data Previous Action: Added to database Previous Assessment Year: 1998
Willamette Yamhill 17090008 25900	South Yamhill River 1231445452258 0 to 61.7 61.7	Zinc	Year Round	Table 20 Toxic Substances	Aquatic life; Human health	Cat 3B: Insufficient data, potential concern	Added to database	2012 Data: [ODEQ] STATION 10948 at RM 16.7 for 9 samples from 04/15/2008 to 02/17/2010, 1 of 9 valid samples exceed the hardness dependent criteria. [ODEQ] STATION 36317 at RM 37.4 for 1 samples from 09/22/2010 to 09/22/2010, 0 of 1 valid samples exceed the hardness dependent criteria

Willamette Yamhill 17090008 16915	Yamhill River 1229962452299 0 to 11.2 11.2	Alkalinity	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 3B: Insufficient data, potential concern	No action	Previous Data: [DEQ] LASAR 10648 River Mile 0: From 8/30/1995 to 8/30/1995, 0 out of 1 samples < 20 mg/L (Table 20 criterion). [DEQ/ODA - Salem] LASAR 10363 River Mile 5: From 1/24/1994 to 12/22/2003, 9 out of 83 samples < 20 mg/L (Table 20 criterion). Previous Status: Cat 3B: Potential concern Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 16916	Yamhill River 1229962452299 0 to 11.2 11.2	Ammonia	Year Round	Table 20 Toxic Substances	Aquatic life	Cat 2: Attaining some criteria/uses	No action	Previous Data: [DEQ/ODA - Salem] LASAR 10363 River Mile 5: From 1/24/1994 to 12/22/2003, 0 out of 112 samples > applicable Table 20 criterion. [DEQ] LASAR 10648 River Mile 0: From 8/30/1995 to 8/30/1995, 0 out of 1 samples > applicable Table 20 criterion. Previous Status: Cat 2: Attaining some criteria/uses Previous Action: Added to database Previous Assessment Year: 2004
Willamette Yamhill 17090008 7157	Yamhill River 1229962452299 0 to 11.2 11.2	Antimony	Year Round	Toxic substances may not be introduced above natural background levels in the waters of the State in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediment...	Drinking water; Resident fish and aquatic life; Anadromous fish passage	Cat 3B: Insufficient data, potential concern	No action	Previous Data: Antimony, Arsenic, Chromium, Copper, Manganese, Nickel and Zinc were found in elevated levels in sediments when compared to various guidelines or guidance values, however, sediment toxicity does not correlate well with sediment contaminant concentrations and is dependent on local conditions. To determine toxicity a demonstration of a beneficial use impairment is needed. No data on beneficial use impairment (e.g. bioassays) is available. For constituents in sediment there is no single type of sediment-quality guideline generally accepted in the scientific literature. Previous Status: Potential concern Previous Action: Added to database Previous Assessment Year: 1998

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Contact

For more information about DEQ's Integrated Report and 303(d) list contact Joshua Emerson (mailto:emerson.joshua@deq.state.or.us) at 503-229-5740.

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Facility #: 125272 HEISER EDITION, LLC (aka. HEISER ADDITION) 2946 REDMOND HILL RD MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125272)
Facility #: 125973 Hoilien, Michael Dean (aka. Michael Dean Hoilien) 2701 NW HORIZON DR MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125973)
Facility #: 125855 J. CONSER AND SONS, LLC (aka. EVERGREEN VALLEY APARTMENTS) NE FIRCREST DR AND NE CUMULUS AVE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125855)
Facility #: 124882 JACKSON FAMILY WINES, INC. (aka. JACKSON FAMILY WINES) 3440 NE THREE MILE LANE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=124882)
Facility #: 126014 K&E Excavating (aka. Evans Street Apartment Complex) 2501 NE EVANS STREET MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=126014)
Facility #: 123808 KLAUS, DEAN C. (aka. YOUR SPACE STORAGE ADDITION) 1500 LAFAYETTE AVE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=123808)

Facility #: 126402 Knife River Corporation - Northwest (aka. Knife River - McMinnville) 1425 NORTHEAST ALPHA DRIVE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=126402)
Facility #: 123659 LAFAYETTE PLACE APARTMENTS, LLC (aka. LAFAYETTE PLACE APARTMENTS) LAFAYETTE AVE AND ORCHARD AVE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=123659)
Facility #: 125084 LCG PENCE CONSTRUCTION (aka. MCMINNVILLE HIGH SCHOOL ADDITION AND REMODEL-PHASE 1) 615 NE 15TH STREET MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125084)
Facility #: 125347 LGI Homes - Oregon LLC (aka. LGI Homes) NW HILL RD AND NW BAKER RD MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125347)
Facility #: 111320 MAYSARA WINERY, LLC (aka. MAYSARA WINERY) 15765 MUDDY VALLEY RD MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=111320)
Facility #: 123043 MCMINNVILLE AREA HABITAT FOR HUMANITY (aka. ATLANTIC STREET COMMUNITY) 105 NW ATLANTIC ST. MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=123043)

Facility #: 106896 MCMINNVILLE, CITY OF (aka. MCMINNVILLE MUNICIPAL AIRPORT) 4000 CIRRUS AVE. MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=106896)
Facility #: 106694 MCMINNVILLE, CITY OF (aka. MCMINNVILLE WATER RECLAMATION FACILITY) 3500 NE CLEARWATER DR MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=106694)
Facility #: 108883 MCMINNVILLE, CITY OF (aka. MCMINNVILLE, CITY OF) 3500 NE CLEARWATER DR MCMINNVILLE, OR 97128-8252	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=108883)
Facility #: 107116 MORELAND OIL CO. (aka. MORELAND OIL CO.) 1700 NE LAFAYETTE AVE MCMINNVILLE, OR 97128-3432	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=107116)
Facility #: 124452 MOSAIC MANAGEMENT INC. (aka. MCMINNVILLE SENIOR LIVING MEMORY CARE FACILITY) 235 NE DUNN PLACE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=124452)
Facility #: 125542 NWSS MCMINNVILLE STORAGE LLC (aka. NW SELF STORAGE - MCMINNVILLE) SALMON RIVER HWY & THREE MILE LN. MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125542)
Facility #: 126006 Olde Stone Village NW, LLC (aka. Olde Stone Village RV Storage Expansion) NE HEATHER DRIVE AND NE DAWN DRIVE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=126006)

Facility #: 125768 PACIFIC NORTH CONSTRUCTION (aka. PACIFIC NORTH CONSTRUCTION) 2090 NE Colvin Ct Mcminnville, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125768)
Facility #: 109300 PAPE' MACHINERY, INC. (aka. PAPE' MACHINERY, INC.) 9889 S. HWY. 99W MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=109300)
Facility #: 126124 Parr Development LLC (aka. Parr Apartment Project) 1601 NE MCDANIEL LANE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=126124)
Facility #: 124107 PREMIER DEVELOPMENT, LLC (aka. WEST VALLEY ESTATES PHASE 4) SW MT. WASHINGTON STREET MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=124107)
Facility #: 126581 Premier Home Builders, Inc. (aka. Colvin Court) 1815 COLVIN COURT MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=126581)
Facility #: 125844 RB&R CONTRACTORS (aka. THE VILLAGE AT BLACK ROCK FALLS) 1730 SW 2ND ST MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125844)
Facility #: 110280 RECOLOGY WESTERN OREGON - VALLEY RECOVERY ZONE, INC. (aka. VALLEY RECOVERY ZONE) 2200 NE ORCHARD AVE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=110280)

Facility #: 106873 RECOLOGY WESTERN OREGON, INC. (aka. RECOLOGY WESTERN OREGON) 1850 NE LAFAYETTE AVE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=106873)
Facility #: 104708 RIVERBEND LANDFILL CO. (aka. RIVERBEND LANDFILL) 14325 S. W. HWY. 18 MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=104708)
Facility #: 106959 RIVERBEND LANDFILL CO. (aka. RIVERBEND LANDFILL) 13469 SW HIGHWAY 18 MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=106959)
Facility #: 105375 ROYAL PACIFIC INDUSTRIES, INC. (aka. ROYAL PACIFIC INDUSTRIES INC) 4035 NE RIVERSIDE DR MCMINNVILLE, OR 97128-9366	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=105375)
Facility #: 126508 Soaring Hill LLC (aka. Soaring Hill LLC) 15500 SW DUSTY DRIVE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=126508)
Facility #: 125325 SP SOLAR 7, LLC (aka. DAYTON CUTOFF SOLAR FARM) 9810 SE AMITY DAYTON HWY MCMINNVILLE, OR 97128-8713	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125325)
Facility #: 109341 UFP MCMINNVILLE, LLC (aka. PLANT 388) 1726 SW HWY 18 MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=109341)
Facility #: 123879 ULTIMATE RB, INC. (aka. RB RUBBER) 904 NE 10TH AVENUE MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=123879)

Facility #: 107592 West Coast Feed and Seed LLC (aka. West Coast Feed and Seed) 102 SE BOOTH BEND ROAD MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=107592)
Facility #: 124842 WEST HILLS PROPERTIES LLC (aka. VALLEY'S EDGE PHASE 4) NW 2ND ST AND SW VALLEY'S EDGE ST MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=124842)
Facility #: 124336 WEST HILLS PROPERTIES, LLC (aka. BROOKSHIRE PHASE 1) WESTERN END OF NW SECOND ST MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=124336)
Facility #: 125020 WORLD CLASS TECHNOLOGY CORPORATION (aka. WORLD CLASS TECHNOLOGY SITE EXPANSION) NE ALPHA DR & NE RIVERSIDE DR. MCMINNVILLE, OR 97128	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125020)
Facility #: 125263 YAMHILL COMMUNITY DEVELOPMENT CORPORATION (aka. WHISPERING MEADOWS) 3055 NE CUMULUS AVE MCMINNVILLE, OR 97114	View Permit(s) (StatusOfPermitApplicationResults.aspx?facilityID=125263)

If you would like to contact DEQ regarding a permit application, please contact your local DEQ office (http://www.deq.state.or.us/about/locations.htm).

APPENDIX II

Drainage Basin Map

PREDEVELOPED BASIN MAP

Predeveloped Basin Map

0 10 20 40
(feet)

INSTALL TEMPORARY 24"SD

GRAVEL CONSTRUCTION ENTRANCE

SILT SACKS (TYP.)

SILT SACKS DOWNSTREAM

BIO BAGS (TYP.)

MEADOW DRIVE

23RD STREET

FENDEL WAY

BRUSH LINE

FIELD

EXISTING DWELLING

SHED

6' WOOD FENCE

NOTES:
1. NO WORK IN WETLANDS PRIOR TO PERMITTING

DEMOLITION LEGEND
- (S) SAWCUT AT DIRECTION OF CITY
- (R) CONTRACTOR TO REMOVE

EROSION CONTROL LEGEND
- SILT SACK
- BIO BAGS
- SILT FENCE
- = WETLANDS

BY	DESCRIPTION	NO.	DATE
	REVISIONS	1	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 05/22/2006

REVIEW REVIEW

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
FENDEL WAY SUBDIVISION

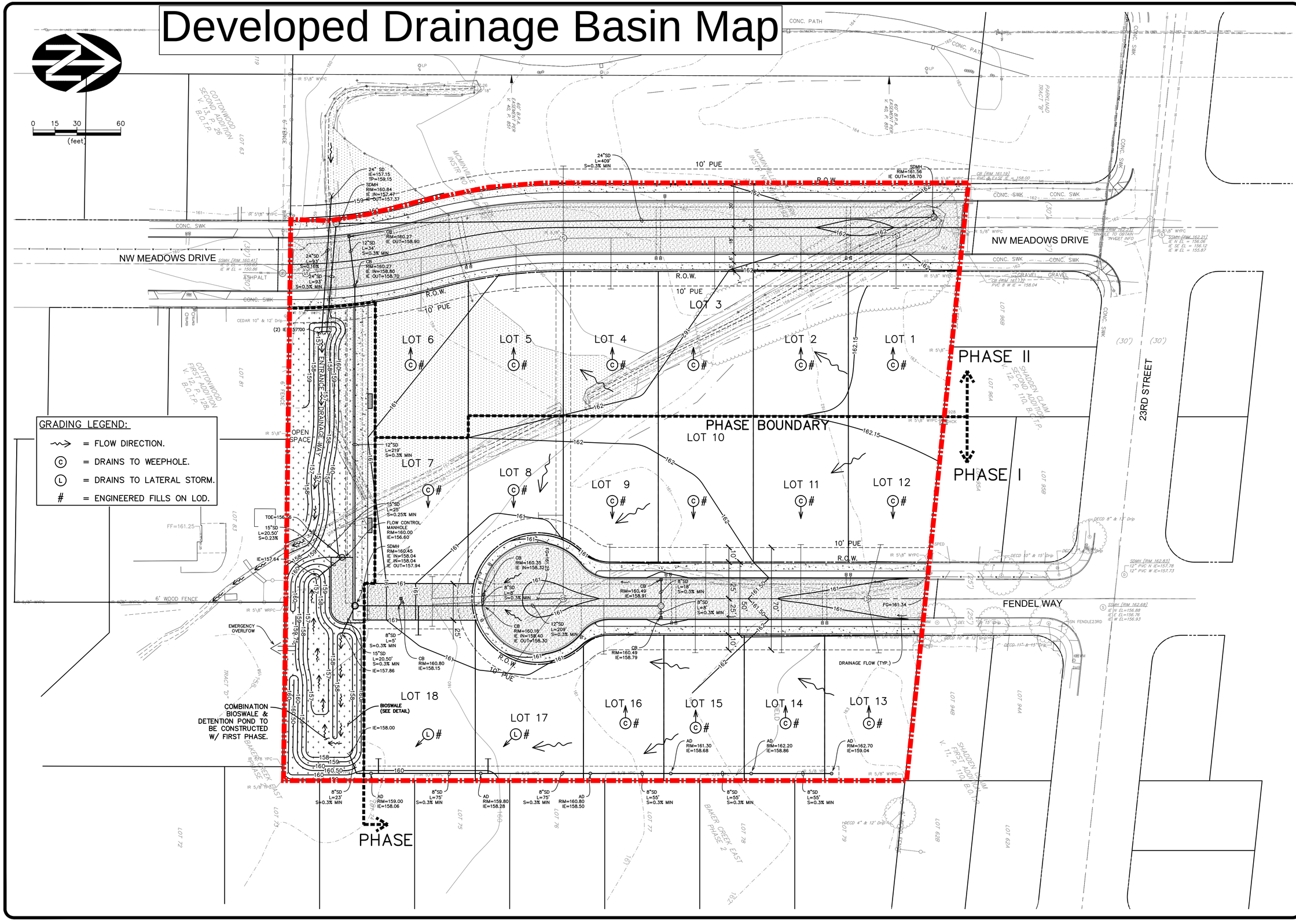
PRE-DEVELOPED EROSION CONTROL PLAN

DRAWING
C1.0

JOB NUMBER
2931.0000.0

DEVELOPED BASIN MAP

Developed Drainage Basin Map



VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

DSN. JW
DRN. IH/AK
CKD. JW
DATE: 05/20/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 1979
WILLIAM L. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

OVERALL GRADING AND DRAINAGE PLAN

DRAWING
C3.0

JOB NUMBER
2931.0000.0

APPENDIX III

Basin Hydrologic Characteristics

SOILS MAPS WITH HYDROLOGIC SOIL GROUP

Map Scale: 1:1,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Yamhill County, Oregon
Survey Area Data: Version 7, Sep 10, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 16, 2015—Feb 12, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2301A	Amity silt loam, 0 to 3 percent slopes	C/D	2.0	40.6%
2310A	Woodburn silt loam, 0 to 3 percent slopes	C	2.9	59.4%
Totals for Area of Interest			**4.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Map Scale: 1:1,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Yamhill County, Oregon
Survey Area Data: Version 7, Sep 10, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

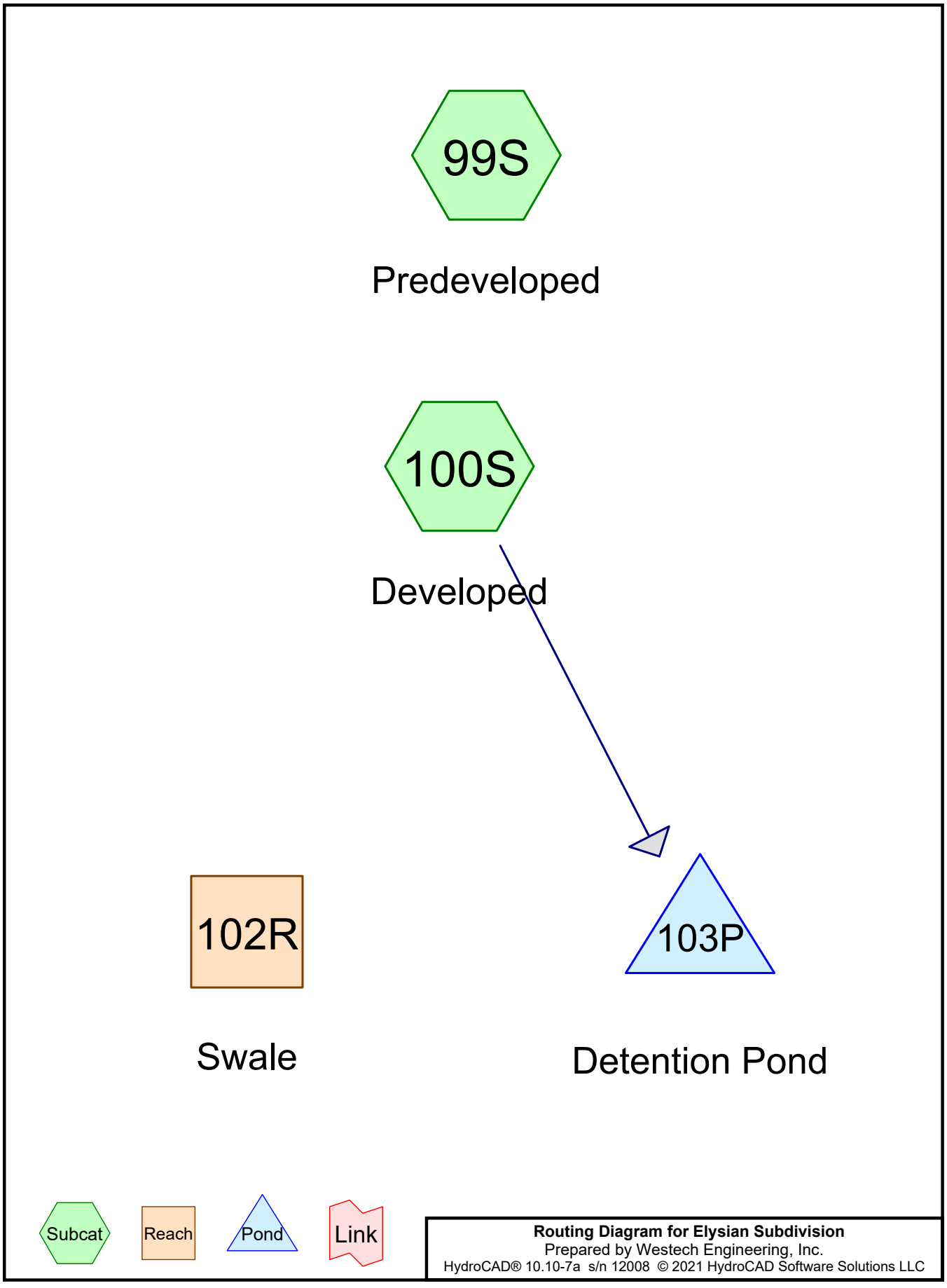
Date(s) aerial images were photographed: Apr 16, 2015—Feb 12, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2301A	Amity silt loam, 0 to 3 percent slopes	2.0	40.6%
2310A	Woodburn silt loam, 0 to 3 percent slopes	2.9	59.4%
Totals for Area of Interest		**4.9**	**100.0%**

HYDROCAD ANALYSIS


99S
Predeveloped
100S
Developed
102R
Swale
103P
Detention Pond
Subcat
Reach
Pond
Link
Routing Diagram for Elysian Subdivision
Prepared by Westech Engineering, Inc.
HydroCAD® 10.10-7a s/n 12008 © 2021 HydroCAD Software Solutions LLC

Summary for Subcatchment 99S: Predeveloped

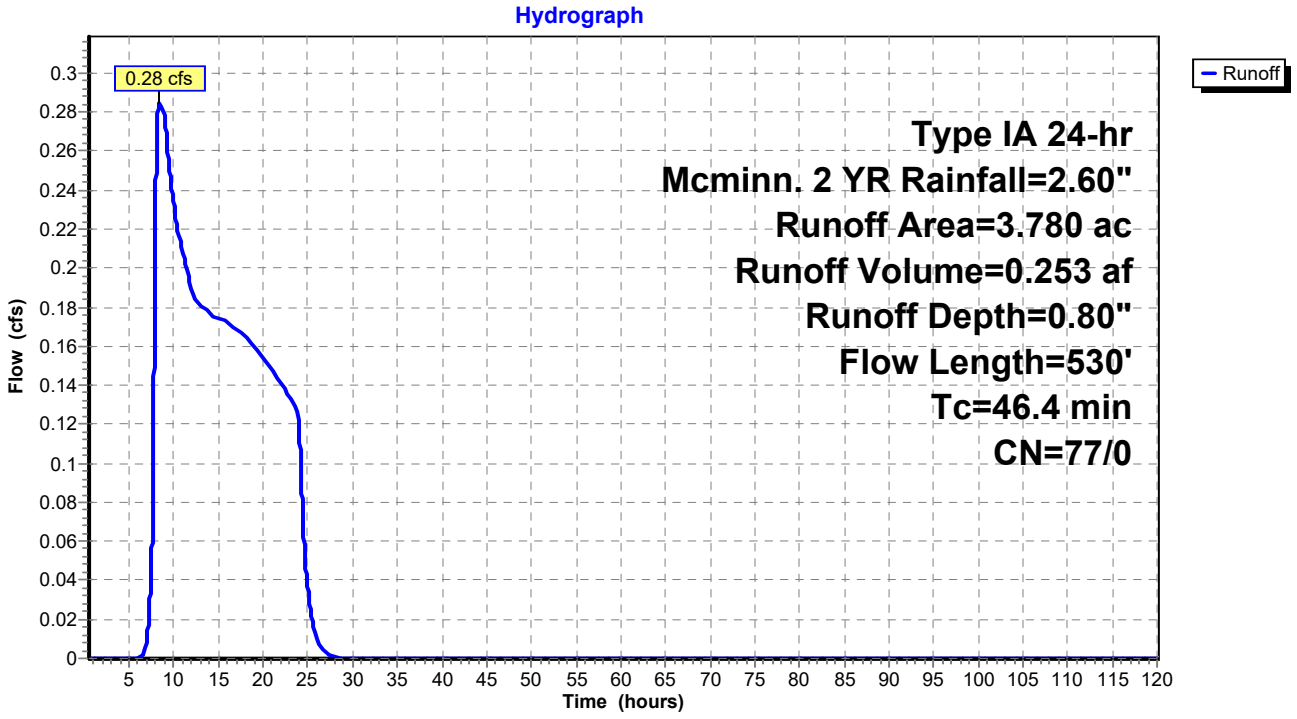
Runoff = 0.28 cfs @ 8.37 hrs, Volume= 0.253 af, Depth= 0.80"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Type IA 24-hr Mcminn. 2 YR Rainfall=2.60"

Area (ac)	CN	Description
2.200	74	Pasture/grassland/range, Good, HSG C
1.580	80	Pasture/grassland/range, Good, HSG D
3.780	77	Weighted Average
3.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	300	0.0107	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.20"
6.0	230	0.0083	0.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
46.4	530	Total			

Subcatchment 99S: Predeveloped



Summary for Subcatchment 99S: Predeveloped

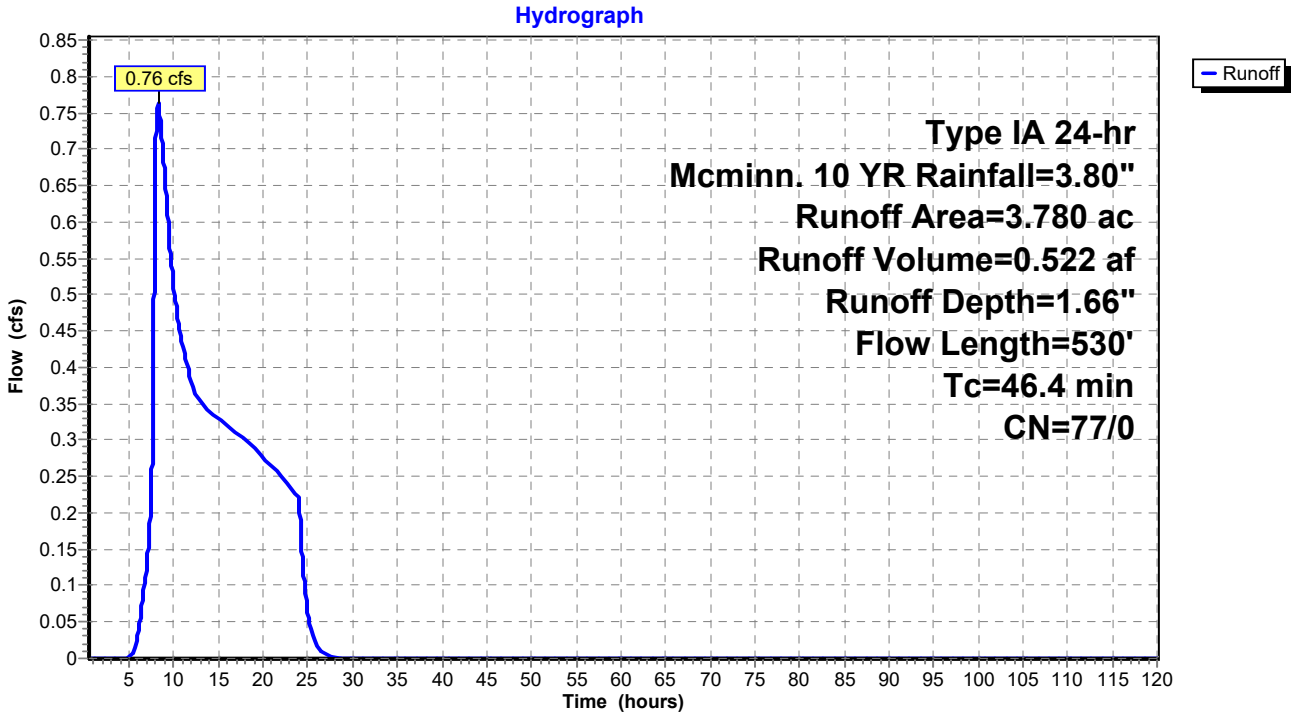
Runoff = 0.76 cfs @ 8.22 hrs, Volume= 0.522 af, Depth= 1.66"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Type IA 24-hr Mcminn. 10 YR Rainfall=3.80"

Area (ac)	CN	Description
2.200	74	Pasture/grassland/range, Good, HSG C
1.580	80	Pasture/grassland/range, Good, HSG D
3.780	77	Weighted Average
3.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.4	300	0.0107	0.12		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.20"
6.0	230	0.0083	0.64		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
46.4	530	Total			

Subcatchment 99S: Predeveloped



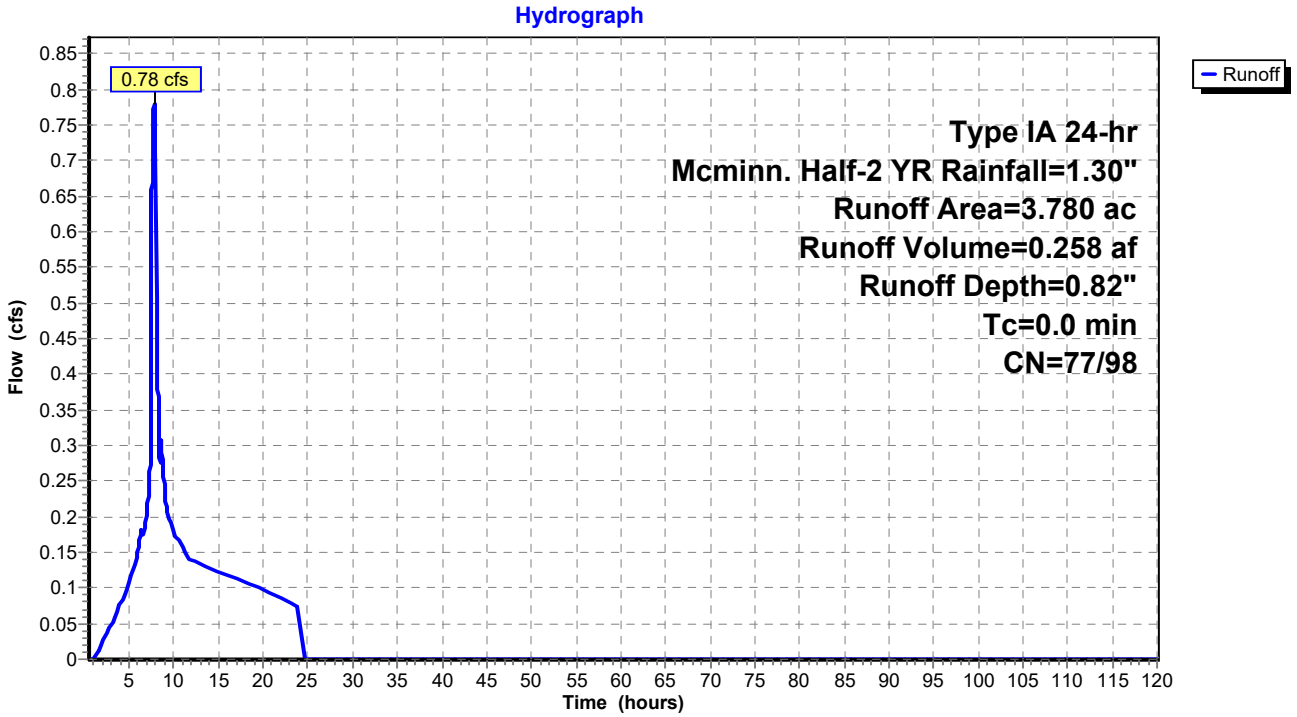
Summary for Subcatchment 100S: Developed

Runoff = 0.78 cfs @ 7.80 hrs, Volume= 0.258 af, Depth= 0.82"
Routed to Reach 102R : Swale

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Type IA 24-hr Mcminn. Half-2 YR Rainfall=1.30"

Area (ac)	CN	Description
0.500	74	>75% Grass cover, Good, HSG C
0.550	80	>75% Grass cover, Good, HSG D
2.730	98	Paved parking, HSG C
3.780	92	Weighted Average
1.050		27.78% Pervious Area
2.730		72.22% Impervious Area

Subcatchment 100S: Developed



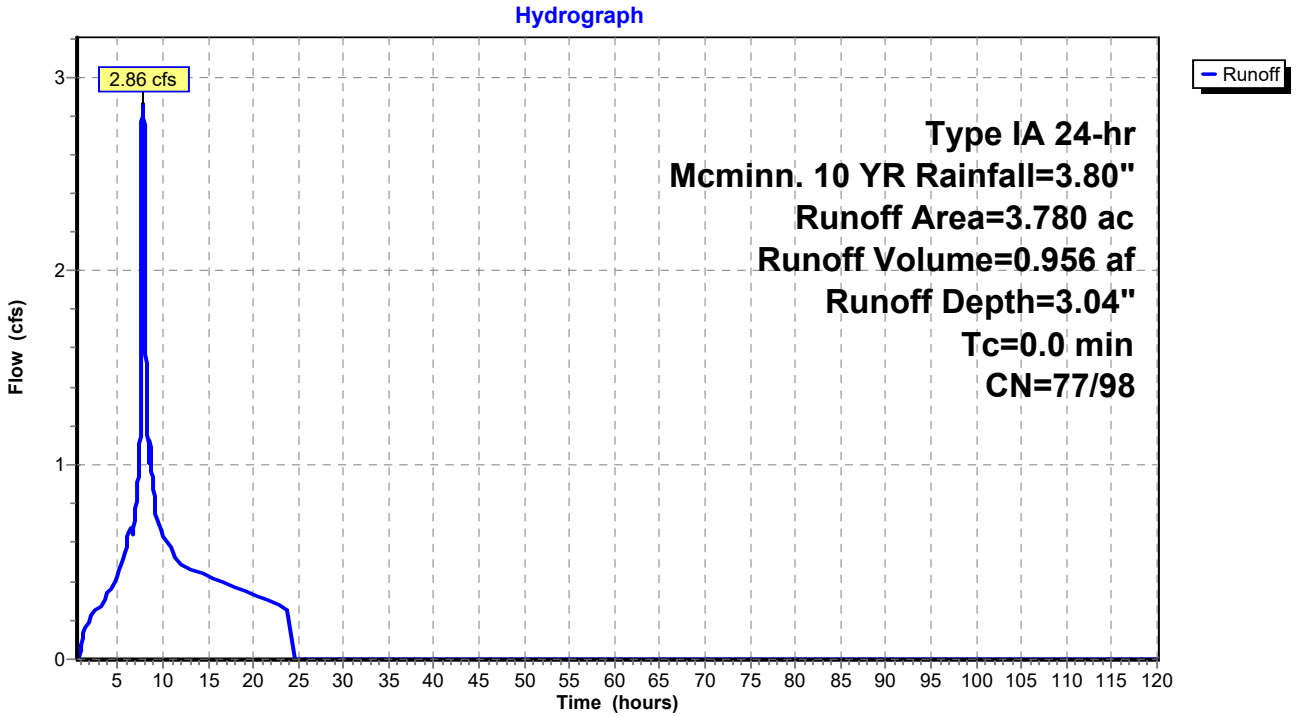
Summary for Subcatchment 100S: Developed

Runoff = 2.86 cfs @ 7.81 hrs, Volume= 0.956 af, Depth= 3.04"
Routed to Reach 102R : Swale

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Type IA 24-hr Mcminn. 10 YR Rainfall=3.80"

Area (ac)	CN	Description
0.500	74	>75% Grass cover, Good, HSG C
0.550	80	>75% Grass cover, Good, HSG D
2.730	98	Paved parking, HSG C
3.780	92	Weighted Average
1.050		27.78% Pervious Area
2.730		72.22% Impervious Area

Subcatchment 100S: Developed



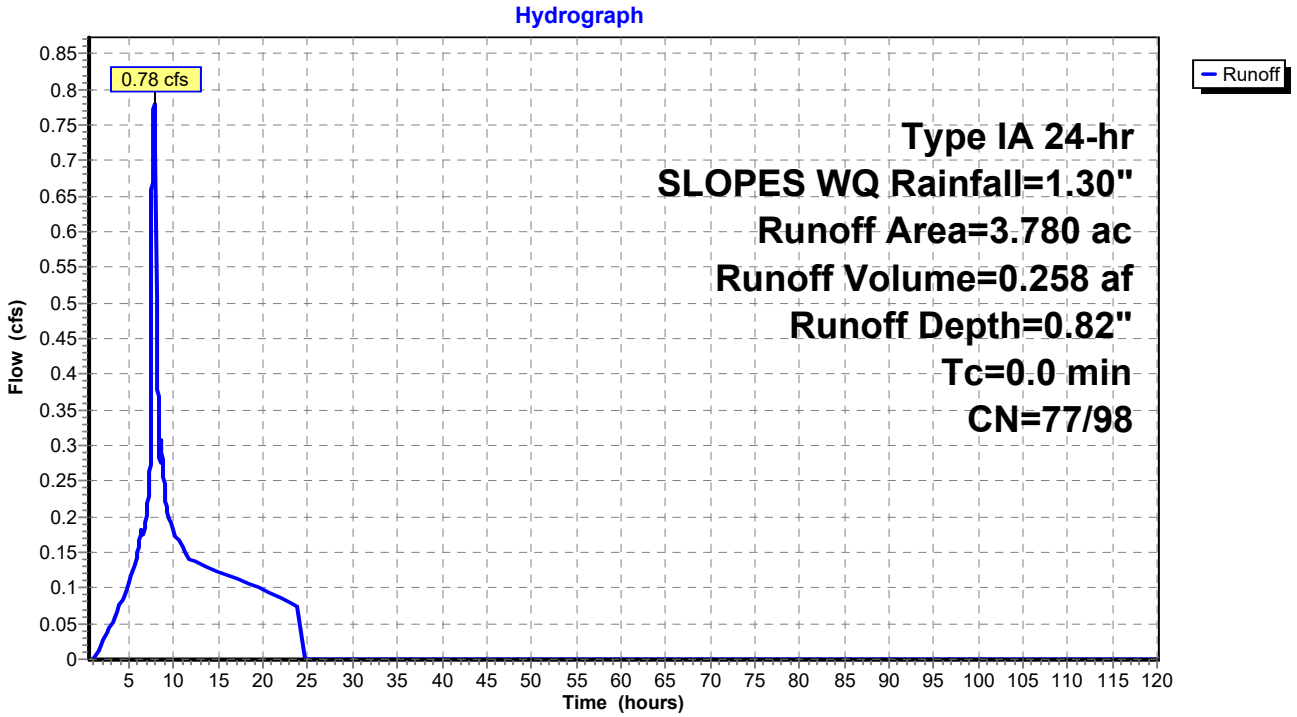
Summary for Subcatchment 100S: Developed

Runoff = 0.78 cfs @ 7.80 hrs, Volume= 0.258 af, Depth= 0.82"
Routed to Reach 102R : Swale

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Type IA 24-hr SLOPES WQ Rainfall=1.30"

Area (ac)	CN	Description
0.500	74	>75% Grass cover, Good, HSG C
0.550	80	>75% Grass cover, Good, HSG D
2.730	98	Paved parking, HSG C
3.780	92	Weighted Average
1.050		27.78% Pervious Area
2.730		72.22% Impervious Area

Subcatchment 100S: Developed



Summary for Pond 103P: Detention Pond

Inflow Area = 3.780 ac, 72.22% Impervious, Inflow Depth = 0.82" for Mcminn. Half-2 YR event
Inflow = 0.78 cfs @ 7.80 hrs, Volume= 0.258 af
Outflow = 0.14 cfs @ 11.60 hrs, Volume= 0.250 af, Atten= 82%, Lag= 228.0 min
Primary = 0.14 cfs @ 11.60 hrs, Volume= 0.250 af

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Peak Elev= 157.56' @ 11.60 hrs Surf.Area= 4,058 sf Storage= 4,002 cf

Plug-Flow detention time= 427.5 min calculated for 0.250 af (97% of inflow)
Center-of-Mass det. time= 404.2 min (1,112.4 - 708.2)

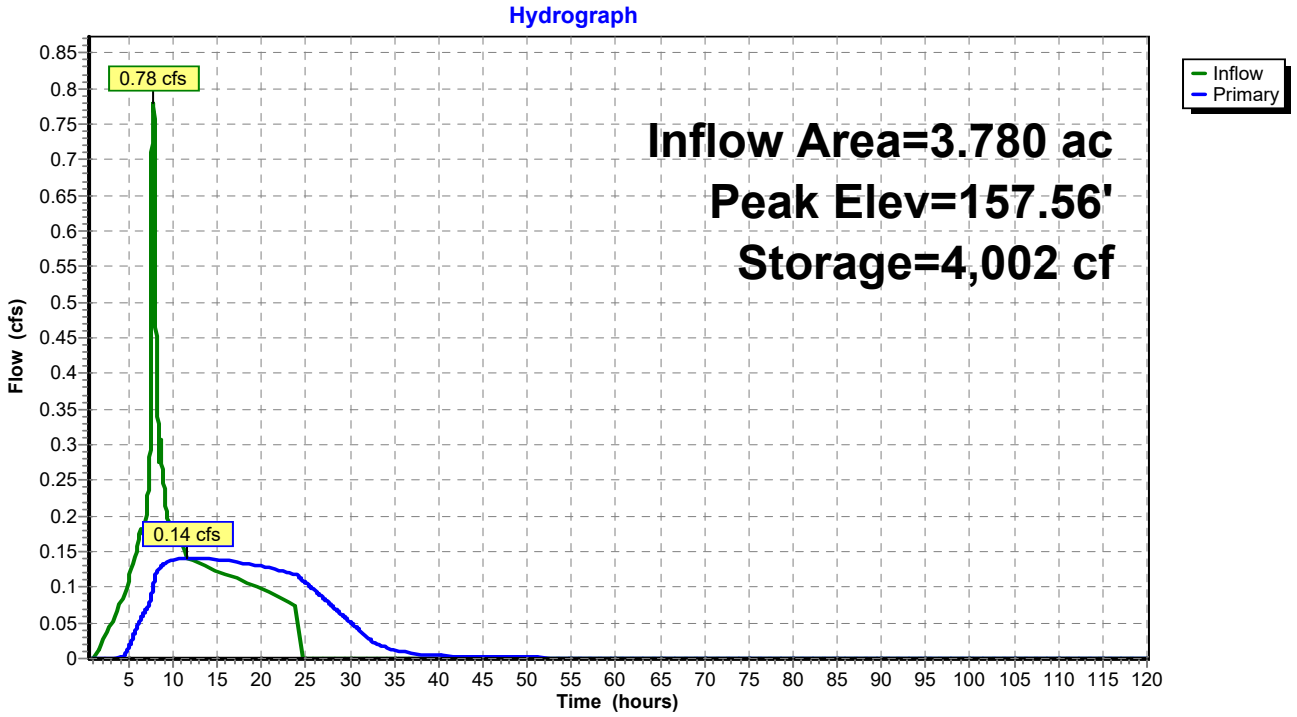
Volume	Invert	Avail.Storage	Storage Description
#1	156.50'	15,533 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.50	3,500	0	0
157.00	3,750	1,813	1,813
158.00	4,300	4,025	5,838
159.00	4,840	4,570	10,408
160.00	5,410	5,125	15,533

Device	Routing	Invert	Outlet Devices
#1	Primary	156.60'	**2.4" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	157.60'	**3.9" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	159.40'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.14 cfs @ 11.60 hrs HW=157.56' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 4.47 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 103P: Detention Pond



Summary for Pond 103P: Detention Pond

Inflow Area = 3.780 ac, 72.22% Impervious, Inflow Depth = 3.04" for Mcminn. 10 YR event
Inflow = 2.86 cfs @ 7.81 hrs, Volume= 0.956 af
Outflow = 0.76 cfs @ 9.23 hrs, Volume= 0.948 af, Atten= 74%, Lag= 85.3 min
Primary = 0.76 cfs @ 9.23 hrs, Volume= 0.948 af

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Peak Elev= 159.38' @ 9.23 hrs Surf.Area= 5,056 sf Storage= 12,283 cf

Plug-Flow detention time= 276.4 min calculated for 0.948 af (99% of inflow)
Center-of-Mass det. time= 270.2 min (950.3 - 680.1)

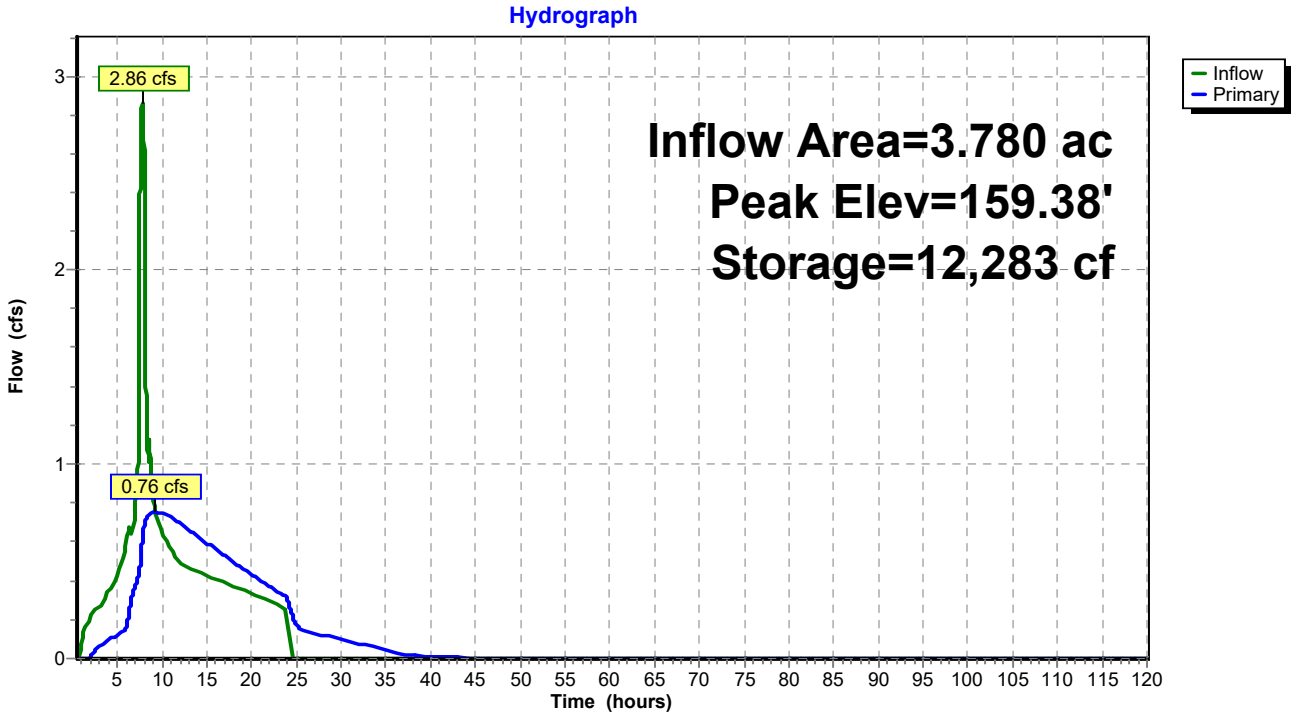
Volume	Invert	Avail.Storage	Storage Description
#1	156.50'	15,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.50	3,500	0	0
157.00	3,750	1,813	1,813
158.00	4,300	4,025	5,838
159.00	4,840	4,570	10,408
160.00	5,410	5,125	15,533

Device	Routing	Invert	Outlet Devices
#1	Primary	156.60'	**2.4" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	157.60'	**3.9" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	159.40'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.76 cfs @ 9.23 hrs HW=159.38' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.25 cfs @ 7.88 fps)
- **2=Orifice/Grate** (Orifice Controls 0.51 cfs @ 6.12 fps)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 103P: Detention Pond



Summary for Pond 103P: Detention Pond

Inflow Area = 3.780 ac, 72.22% Impervious, Inflow Depth > 4.65" for Mcminn. 100 YR event
Inflow = 4.40 cfs @ 7.80 hrs, Volume= 1.464 af
Outflow = 3.30 cfs @ 8.01 hrs, Volume= 1.455 af, Atten= 25%, Lag= 12.4 min
Primary = 3.30 cfs @ 8.01 hrs, Volume= 1.455 af

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Peak Elev= 159.82' @ 8.01 hrs Surf.Area= 5,308 sf Storage= 14,576 cf

Plug-Flow detention time= 236.5 min calculated for 1.455 af (99% of inflow)
Center-of-Mass det. time= 232.1 min (904.0 - 671.8)

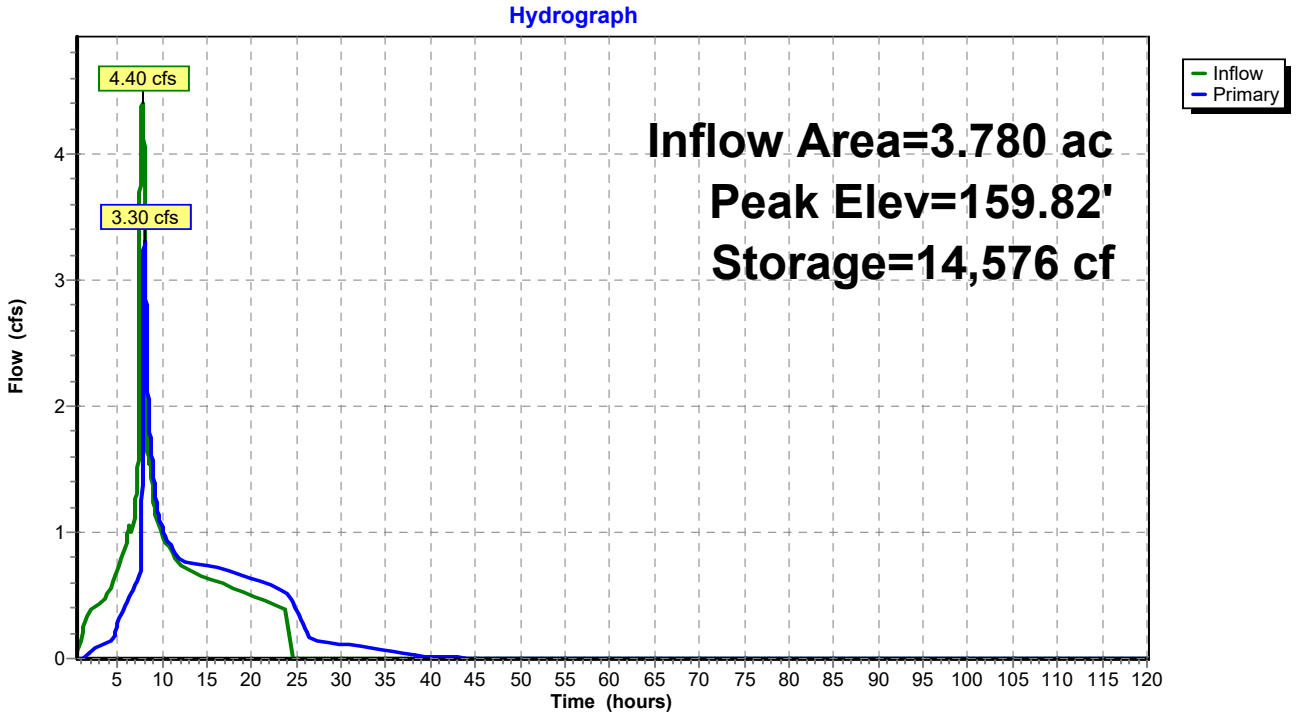
Volume	Invert	Avail.Storage	Storage Description
#1	156.50'	15,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.50	3,500	0	0
157.00	3,750	1,813	1,813
158.00	4,300	4,025	5,838
159.00	4,840	4,570	10,408
160.00	5,410	5,125	15,533

Device	Routing	Invert	Outlet Devices
#1	Primary	156.60'	**2.4" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	157.60'	**3.9" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	159.40'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.29 cfs @ 8.01 hrs HW=159.82' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.27 cfs @ 8.51 fps)
- **2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 6.91 fps)
- **3=Orifice/Grate** (Orifice Controls 2.45 cfs @ 3.12 fps)

Pond 103P: Detention Pond



Summary for Pond 103P: Detention Pond

Inflow Area = 3.780 ac, 72.22% Impervious, Inflow Depth = 0.82" for SLOPES WQ event
Inflow = 0.78 cfs @ 7.80 hrs, Volume= 0.258 af
Outflow = 0.14 cfs @ 11.60 hrs, Volume= 0.250 af, Atten= 82%, Lag= 228.0 min
Primary = 0.14 cfs @ 11.60 hrs, Volume= 0.250 af

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Peak Elev= 157.56' @ 11.60 hrs Surf.Area= 4,058 sf Storage= 4,002 cf

Plug-Flow detention time= 427.5 min calculated for 0.250 af (97% of inflow)
Center-of-Mass det. time= 404.2 min (1,112.4 - 708.2)

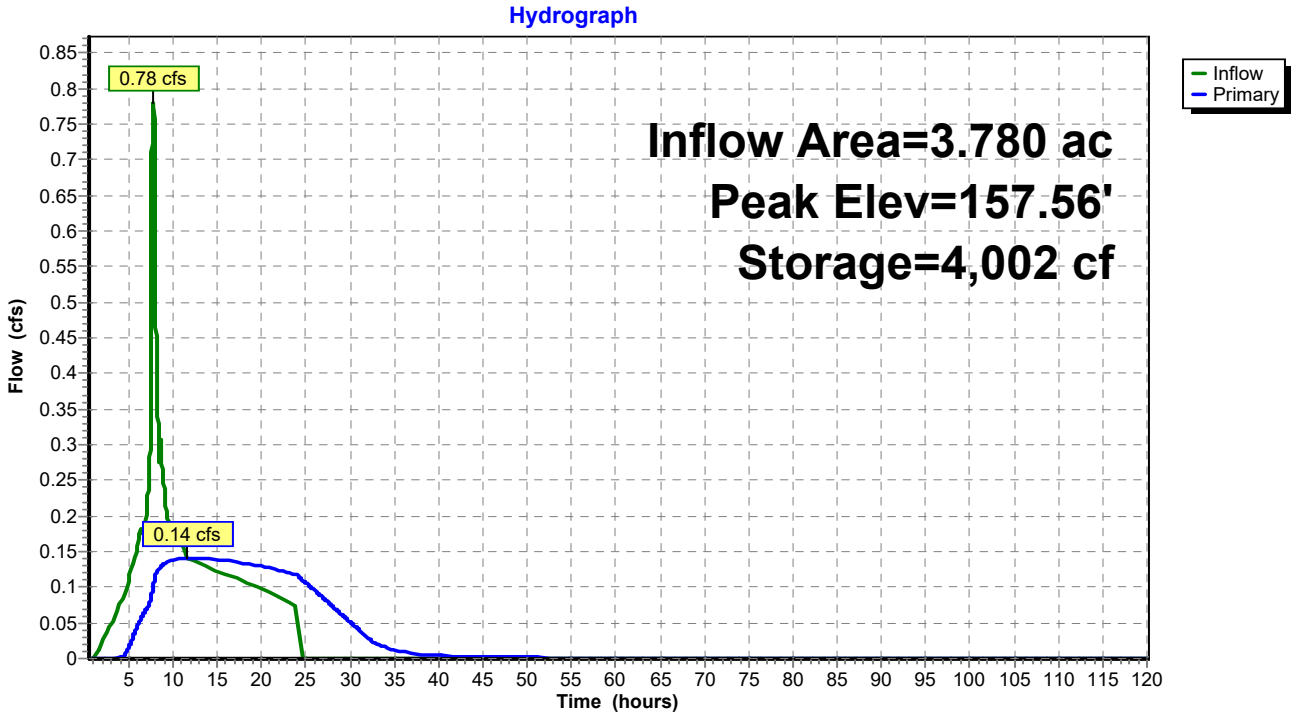
Volume	Invert	Avail.Storage	Storage Description
#1	156.50'	15,533 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
156.50	3,500	0	0
157.00	3,750	1,813	1,813
158.00	4,300	4,025	5,838
159.00	4,840	4,570	10,408
160.00	5,410	5,125	15,533

Device	Routing	Invert	Outlet Devices
#1	Primary	156.60'	**2.4" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	157.60'	**3.9" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	159.40'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.14 cfs @ 11.60 hrs HW=157.56' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 4.47 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 103P: Detention Pond



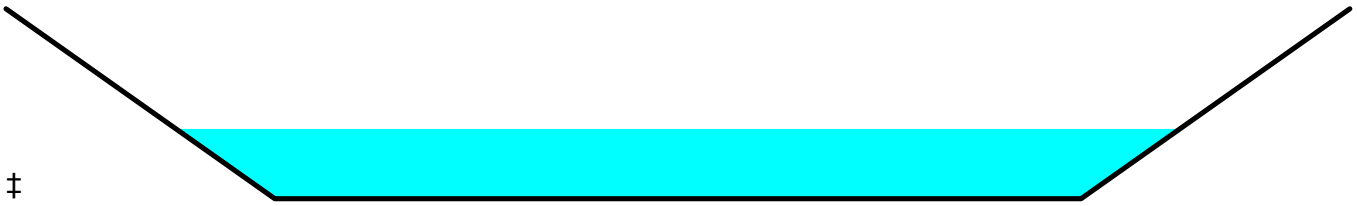
Summary for Reach 102R: Swale

Inflow Area = 3.780 ac, 72.22% Impervious, Inflow Depth = 0.82" for SLOPES WQ event
Inflow = 0.78 cfs @ 7.80 hrs, Volume= 0.258 af
Outflow = 0.69 cfs @ 8.00 hrs, Volume= 0.258 af, Atten= 11%, Lag= 11.7 min

Routing by Stor-Ind method, Time Span= 0.50-120.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.19 fps, Min. Travel Time= 19.2 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 64.3 min

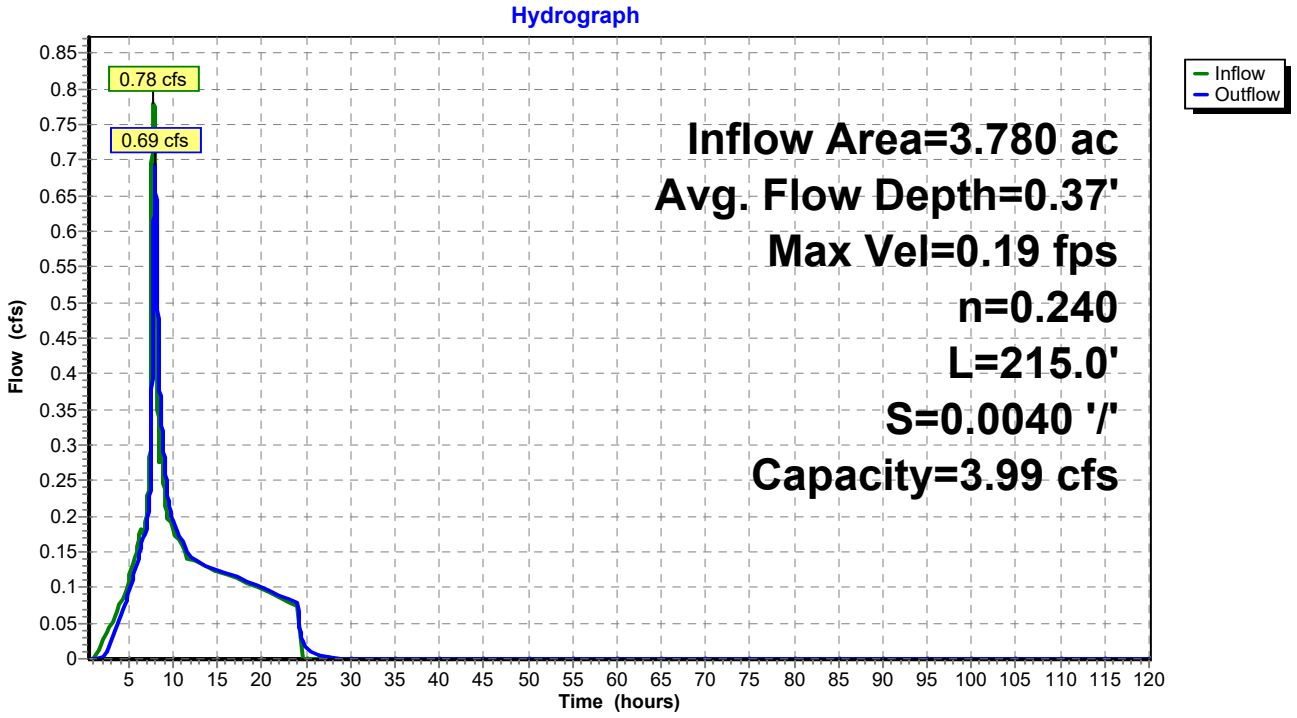
Peak Storage= 799 cf @ 8.00 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 11.21'
Bank-Full Depth= 1.00' Flow Area= 12.0 sf, Capacity= 3.99 cfs

9.00' x 1.00' deep channel, n= 0.240
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 215.0' Slope= 0.0040 '/'
Inlet Invert= 157.86', Outlet Invert= 157.00'



‡

Reach 102R: Swale



PRECIPITATION FREQUENCY ATLAS – ATLAS 2

NOAA ATLAS 2

Precipitation-Frequency Atlas of the Western United States

J. F. Miller, R. H. Frederick, and R. J. Tracey

Volume X–Oregon

U.S. DEPARTMENT OF COMMERCE
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NOAA ATLAS 2

Precipitation Frequency Atlas of the Western United States

Volume	I.	Montana
Volume	II.	Wyoming
Volume	III.	Colorado
Volume	IV.	New Mexico
Volume	V.	Idaho
Volume	VI.	Utah
Volume	VII.	Nevada
Volume	VIII.	Arizona
Volume	IX.	Washington
Volume	X.	Oregon
Volume	XI.	California

UDC 551.577.36(084.4)(795)

551.5	Meteorology
.577	Precipitation
.36	Frequencies
(084.4)	Atlases
(795)	Oregon

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Abstract

Each volume of this Atlas contains precipitation-frequency maps for 6- and 24-hr durations for return periods from 2 to 100 yrs for one of the 11 western states (west of about 103° W.). Also included are methods and nomograms for estimating values for durations other than 6 and 24 hrs. This new series of maps differs from previous publications through greater attention to the relation between topography and precipitation-frequency values. This relation is studied objectively through the use of multiple regression screening techniques which develop equations used to assist in interpolating values between stations in regions of sparse data. The maps were drawn on a scale of 1:1,000,000 and reduced to 1:2,000,000 for publication.

In addition to the maps, each volume includes a historical review of precipitation-frequency studies, a discussion of the data handling and analysis methods, a section on the use and interpretation of the maps, and a section outlining information pertinent to the precipitation-frequency regime in the individual state. This state section includes a discussion of the importance of snow in the precipitation-frequency analysis and formulas and nomograms for obtaining values for 1-, 2-, 3-, and 12-hr durations.

Preface

Previous precipitation-frequency studies for the 11 western states have considered topography in only a general sense despite the numerous mountain ranges present. As a result, variation in precipitation-frequency values is greater than was portrayed in these studies. In this Atlas, the relation between precipitation-frequency values and topography has been considered both objectively and subjectively.

This work has been supported and financed by the Soil Conservation Service, Department of Agriculture, to provide material for use in developing planning and design criteria for the Watershed Protection and Flood Prevention program (P.L. 566, 83d Congress and as amended).

Each volume of the Atlas can be considered to consist of three parts. The first part contains several sections giving a historical review of the field, a discussion of the approach and methods used in the development of the precipitation-frequency maps, and a discussion of how to interpret and use the maps. This section outlines the general background information and is applicable to all states. The second part of the Atlas contains a discussion of items pertinent to the individual state. Included in this section are methods and nomograms designed to estimate precipitation-frequency values for durations other than 6 and 24 hrs. These procedures were developed for broad geographic regions; the ones applicable to a particular state are included in the appropriate volume. The last part contains the maps for the 6- and 24-hr durations for return periods of 2, 5, 10, 25, 50, and 100 yrs.

Coordination with the Soil Conservation Service was maintained through Kenneth M. Kent, Chief, Hydrology Branch, Engineering Division, and through his successor, Robert E. Rallison. The work was done in the Special Studies Branch, Water Management Information Division, Office of Hydrology, National Weather Service. Hugo V. Goodyear, Chief of the Branch (since retired) made many contributions to the preparation of the final manuscript. Overall direction and guidance was furnished by William E. Hiatt, Associate Director (Hydrology), National Weather Service, his successor, Max A. Kohler, and Joseph Paulhus, former Chief, Water Management Information Division. Data tabulations, computations and many other assisting duties were done by the Branch meteorological technicians.

Introduction

Objective

Although generalized maps of precipitation-frequency values have been available for many years, the construction of isopluvial lines in mountainous regions has been done considering topography and its effect on precipitation in a general sense only. Investigations for this Atlas were undertaken to depict more accurately variations in the precipitation-frequency regime in mountainous regions of the 11 conterminous states west of approximately 103° W. These investigations are intended to provide material for use in developing planning and design criteria for the Watershed Protection and Flood Prevention programs.

Primary emphasis has been placed on developing generalized maps for precipitation of 6- and 24-hr duration and for return periods of 2 to 100 yrs. Procedures also have been developed to estimate values for 1-hr duration. Values for other durations can be estimated from the 1-, 6-, and 24-hr duration values.

Historical Review

The first generalized study of the precipitation-frequency regime for the United States was prepared in the early 1930's by David L. Yarnell (1935). Yarnell's publication contains a series of generalized rainfall maps for durations of 5 min to 24 hrs for return periods of 2 to 100 yrs. Yarnell's study served as a basic source of frequency data for economic and engineering design until the middle 1950's. The maps were based on data from about 200 first-order Weather Bureau stations equipped with recording precipitation gages. In 1940, about 5 yrs after Yarnell's study was published, a hydrologic network of recording gages, supported largely by the U.S. Army Corps of Engineers, was installed. This was done to supplement the Weather Bureau recording-gage network and the network of a relatively large number of nonrecording gages maintained by private individuals in cooperation with the Weather Bureau, for a long period of years. The additional recording gages have subsequently increased the amount of short-duration (1- to 24-hr) precipitation data by a factor of about 20.

Weather Bureau Technical Paper No. 24, published in two parts, (U.S. Weather Bureau 1953–54a) was prepared for the Corps of Engineers, in connection with its military construction program. This Technical Paper contained the results of the first investigation of precipitation-frequency information for an extensive region of the increased hydrologic data network. The results showed the importance of the additional data for defining the short-duration rainfall-frequency regime in a mountainous region of the western United States. In many instances, the differences between the values given in Technical Paper No. 24 and those given by Yarnell reach a factor of three, with Yarnell's figures generally higher. Results from these two studies in the United States were then used to prepare similar reports for the coastal regions of North Africa (U.S. Weather Bureau 1954b) and for several Arctic regions (U.S. Weather Bureau 1955a) where recording-gage data were lacking. These reports were also prepared in cooperation with the Corps of Engineers to support its military construction program.

In 1955, the Weather Bureau and the Soil Conservation Service began a cooperative effort to define the depth-area-duration precipitation-frequency regime in the entire United States. *Weather Bureau Technical Paper* No. 25 (U.S. Weather Bureau 1955b), partly a byproduct of previous work done for the Corps of Engineers, was the first study published under the sponsorship of the Soil Conservation Service; it contains a series of precipitation intensity-duration-frequency curves for about 200 first-order Weather Bureau stations. This was followed by *Weather Bureau Technical Paper* No. 28 (U.S. Weather Bureau 1956) which was an expansion of information contained in Technical Paper No. 24 to longer return periods and durations. The five parts of *Weather Bureau Technical Paper* No. 29 (U.S. Weather Bureau 1957–60), for the region east of longitude 90° W., were published next. This Technical Paper included seasonal variation on a frequency basis and area-depth curves so that the point-frequency values could be transformed to areal-frequency values.

In the next study, *Weather Bureau Technical Paper* No. 40 (U.S. Weather Bureau 1961), the results of previous Weather Bureau investigations of the precipitation-frequency regime of the conterminous United States were combined into a single publication. Investigations by the Weather Bureau during the 1950's had not covered the region between longitudes 90° and 105° W. Technical Paper No. 40 contained the results of an investigation for this region, and was the first such study of the midwestern plains region since Yarnell's work of the early 1930's. Topography was considered only in a general sense in this and earlier studies.

Technical Paper No. 40 has been accepted as the standard source for precipitation-frequency information in the United States for the past decade. Results presented in that publication are most reliable in relatively flat plains. While the averages of point values over relatively large mountainous regions are reliable, the variations within such regions are not adequately defined. In the largest of these regions, the western United States, topography plays a significant role in the incidence and distribution of precipitation. Consequently, the variations in precipitation-frequency values are actually greater than portrayed in the region. Investigations reported herein were made using currently available longer records and the maximum number of stations possible (consistent with the constraints explained in the section on Basic Data).

Analysis

Approach

The approach used for this Atlas is basically the same as that used for Technical Paper No. 40, in which simplified relations between duration and return period were used to determine numerous combinations of return periods and durations from several generalized key maps. For this Atlas, relations were developed between precipitation-frequency values and meteorologic and topographic factors at observing sites. These were used to aid in interpolating values between stations on the key maps.

The key maps developed in this study were for 2- and 100-yr return periods for 6- and 24-hr durations. The initial map developed was for the 2-yr return period for the 24-hr duration. This return period was selected because values for shorter return periods can be estimated with greater reliability than for longer return periods. The 24-hr duration was selected because this permitted use of data from both recording and nonrecording gages. Also, because an extensive nonrecording-gage network was in existence for many years before the recording-gage network was established in 1940, the period of record available for 24-hr observations is much longer than that for the 6-hr duration. The second map developed was for the 100-yr return period for the 24-hr duration. In the development of this map the advantage of maximum sample size and length of record was retained at the expense of some decrease in reliability of computed values. The 6-hr maps for the 2- and 100-yr return periods followed. For the 6-hr duration, the sample size was materially smaller in both numbers and length of record because only recording-gage data could be used. After these four maps were completed, values for intermediate return periods were computed for a grid of about 47,000 points, and appropriate maps were prepared.

In previous studies, topography was considered only in a general sense and the isopluvials were drawn by interpolating subjectively between the individual stations. In preparing this Atlas, multiple linear regression equations were developed for each of many regions of the western United States as an aid to estimating the precipitation-frequency values at each of about 47,000 grid points. These equations related topographic and climatologic factors to the variations in the precipitation-frequency values. Isopluvials were smoothed subjectively between values in adjoining regions. The subjective smoothing was based upon experience in analyzing precipitation-frequency maps; the amount of smoothing was rarely greater than the standard error of estimate for the equations in the adjoining regions.

Basic Data

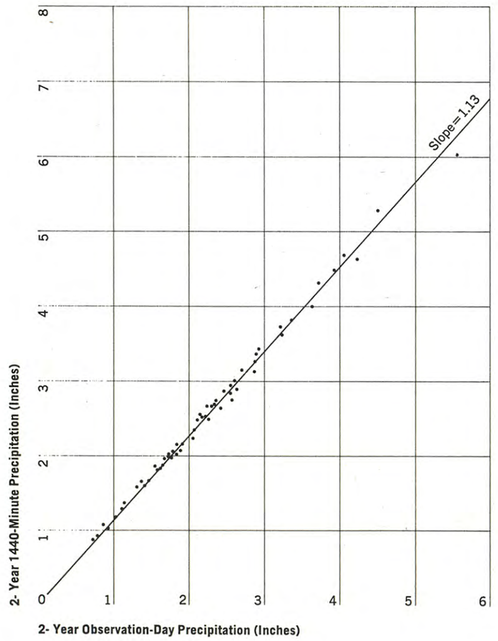
Station location. Frequency analysis of precipitation data requires a relatively long and stable station record. In analyzing a mean annual or a seasonal precipitation map, it is possible to use double-mass curve analysis to evaluate the effects of changes in station location or exposure. Within limits, the effects of differing locations on the annual precipitation values can be eliminated by use of relations determined from the double-mass curve analysis (Weiss and Wilson 1953). However, no technique for evaluation and modification of a series of extreme precipitation values has been developed. Therefore, it was necessary to ensure that the data used in this Atlas represented, as nearly as possible, observations taken from a single location.

Official records of station locations (latitude, longitude, and elevation) were examined to determine physical moves. The criterion was adopted that if a move at any station changed the elevation 100 ft or more or changed the horizontal location 5 mi or more, its data were treated as though they came from separate stations. In some cases, a station retained the same name but investigation indicated that it had been moved beyond acceptable limits. In such cases, the records for the station were terminated and new records were started. In other cases, published sources indicated location changes beyond acceptable limits, but subsequent inspection of records indicated these changes were corrections to reported values of elevation, latitude, or longitude rather than actual physical moves. Thus, the observations for the station actually were continuous at one location. Occasionally, a lesser move resulted in a significant difference in exposure, such as from the windward to the lee side of a mountain range. Data from stations such as these also were treated as data from separate stations.

Types of data. The primary data used in this Atlas can be divided into two categories. First, there are data from recording gages; these data are published for clock-hour intervals. These data were processed to obtain maximum 6- and 24-consecutive clock-hour amounts for each month of record. The time interval selected did not have to start at a particular hour; for example, the 6-hr interval might be from 1 to 7 a.m., or from 3 to 9 p.m.; the 24-hr interval might be from 4 a.m. on one day to 4 a.m. on the following day, or from 2 p.m. on one day to 2 p.m. on the next. Second, there is the large amount of data from nonrecording gages. At these gages, observations are usually made once each day at a given time for each station. At observation time, the amount of precipitation that fell in the preceding 24-hr interval is measured; this precipitation may have fallen during any part or all of the 24-hr period. These data are commonly referred to as observation-day amounts.

A subset of data in the first category is the recording-gage data from the long-record first-order Weather Bureau (now National Weather Service) stations. There are approximately 200 such stations in the entire country (about 50 in the western United States). Maximum values for each year of record from these stations have been tabulated for the various durations to the nearest minute. The maximum 6-hr amount recorded each year is for a period of 360 consecutive minutes, regardless of the time beginning; for example, such a period might begin at 2:03 p.m. or at 3:59 p.m. Similarly, data for the 24-hr duration are for a 1,440-min period. These amounts are commonly referred to as *n*-minute amounts.

Figure 1. *Relation between 2-yr 1,440-min precipitation and 2-yr observation-day precipitation.*



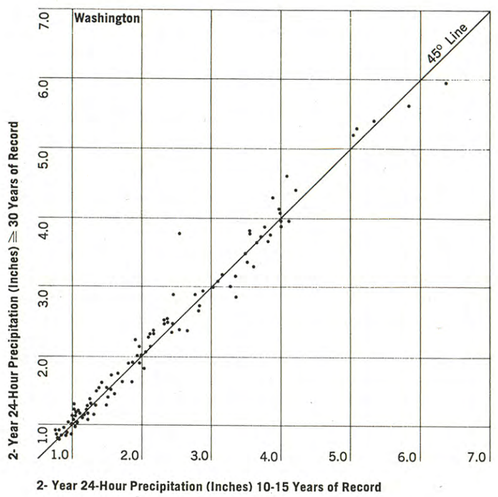


Figure 2. *Test of 2-yr 24-hr precipitation values from short- and long-record stations for the State of Washington.*

Fixed- versus true-interval precipitation values. The continuous clock-hour and observation-day data from most stations are available for intervals fixed by arbitrary clock intervals. Because the time of occurrence of precipitation is a random phenomenon, straddling often occurs; for example, part of the maximum precipitation may start in one time interval and end in the succeeding time interval. Seldom does maximum precipitation for a specified duration occur within a mandatory measurement interval. For this reason, it was necessary to use relations between fixed-time intervals (of actual occurrence) and the 360- and 1,440-min periods to make maximum use of available data.

These relations have been investigated in previous studies (U.S. Weather Bureau 1954a, 1956, 1957–60). It was found that on the average 1.13 times a statistical value for a particular return period, based on a series of annual maximum observation-day (fixed-interval) amounts, was equivalent to a statistical value for the same return period obtained from a series of 1,440-min (true-interval) values. The ratio of statistical values computed from a series of six consecutive clock-hour measurements to those from a series of 360-min observations is 1.02; a similar ratio of statistical values computed from 24 consecutive clock-hour amounts to those from 1,440 min values is 1.01.

These ratios (for example, *n*-year 1,440-min precipitation equals 1.13 times *n*-year observation-day precipitation) are not built on a causal relation. They are average index ratios because the distributions of observation-day, *n*-hour, and *n*-minute precipitation are irregular and unpredictable. For example, the annual maxima of the two series for the same year do not necessarily come from the same storm. Graphical comparison of the values for the 2-yr return period based on observation-day and 1,440-min precipitation data is shown in figure 1.

The frequency and amount of straddling that occur can be investigated on probability considerations as well as empirically. The time axis can be represented by a straight line separated into uniform time intervals by an evenly spaced series of points. These intervals can represent individual hours, 6- or 24-hr periods, an observation day, and so forth. The maximum precipitation for any duration can be assumed to occur at a uniform rate in a time unit exactly equal to one of the fixed intervals, but without regard to the location of the fixed intervals. This time unit may fall at random with respect to the fixed intervals and will, in general, overlap two adjacent intervals. Using probability theory, Weiss (1964) confirmed the empirical values used.

Data sources. The primary data sources used were *Climatological Data for the United States by Sections* (National Climatic Center 1897–1970) and *Hourly Precipitation Data* (National Climatic Center 1940–70). In California, it was possible to increase the data sample 15 to 20 percent by using unpublished data from gages maintained by the State, local agencies, private corporations, or individuals (California, Department of Water Resources 1900–69). Published data are routinely of high quality because of periodic checks of observing sites and observation techniques and the quality-control procedures used in the publication process. The quality of unpublished data must be checked by a review of the inspection records of the organization maintaining the gage and by a careful screening of the data.

Length and period of record. In preparing generalized maps of precipitation-frequency values, a uniform period of record several times the length of the return period desired and computed at a relatively dense network of stations (for sampling all data and topographic extremes) is the ideal. In practical work, compromises are necessary.

The use of a nonuniform record period, especially when the period is short, may result in unrealistic relations between stations. For instance, if data taken during a short-record period at one station were taken during a relatively dry period, while data from the neighboring station were taken during a relatively wet period, the interstation relation would not be valid. Because the objective of this investigation is to define the geographic variation in mountainous regions, it is desirable to minimize other causes of variation. Use of a standard base period would minimize the above variation. This is common practice in the preparation of mean annual precipitation maps and also can be applied to the preparation of precipitation-frequency maps for shorter return periods.

Determination of precipitation-frequency values is usually based upon the longest record available. These values are assumed to be reasonably representative of the values that would be obtained if the entire record were known. The use of a short-record base period requires testing to determine if the data provide unbiased results representative of values that would be obtained from use of a long-record base period. For most regions covered in this study, the most recent 15-yr period immediately preceding the period when the maps for this Atlas were developed was used to compute precipitation values for the 2-yr return period. At locations with at least 30 years of data, the 2-yr values from the 15-yr base period were compared with the 2-yr values computed using the total record. If the differences between the two series were small and randomly distributed, the 15-yr base period was adopted for all stations. Figure 2 shows the result of such a test for the 24-hr duration values for stations in Washington. The same test was made for the rest of the western states.

In most of California and Nevada, the values computed from the 15-yr base period data showed significant differences and some bias to values based upon the total record. In this region, it was necessary to use values based on the longest record possible for each station in preparation of the 2-yr maps. Stations without data during all or most of the more recent years were identified on the working maps.

To make use of data from the maximum number of stations, data from stations with 10 to 14 yrs of record were used in preparing the 2-yr maps. Such stations also were suitably identified on the working maps so that the analyst could use judgment in his interpretation of such values.

While a 15-yr record provides data several times the length of the return period for 2-yr maps, it provides only a small fraction of the length of the 100-yr return period. During a 15-yr period, some stations may experience precipitation amounts equivalent to a return period of 50, 100, or more years. However, the probability of having a 100-yr value in any preselected 15-yr period is only 0.14. Similarly, the probability of *not* having a true 15-yr return period value in any preselected 15-yr period is about 0.09. Thus, in a given 15-yr period, the probability that a station has received its true 100-yr value is not greatly different from the probability that its neighboring station has *not* experienced its true 15-yr value. While, admittedly, this would be an extreme case, this example shows the importance of using as long a record as possible when preparing precipitation-frequency maps for long return periods. In this study, records for as long as possible for each station (without violating the 100-ft or 5-mi criterion) were used to compute the 100-yr return period values. The length of record and a confidence band to indicate the range of values likely to be experienced at each station were included in the plotting model. With this information, the analyst could more effectively evaluate the reliability of each data point.

Published and unpublished data from approximately 3,300 stations were used in this study. The number of stations grouped by length of record and state are shown in table 1. Many recording gages were established at sites where nonrecording gages had been located for many years. In table 1, the first column for each state shows the number of stations with recording-gage data. The second column for each state shows the total period of record for which observation-day data were available for each of these stations. The total record includes both recording and nonrecording data for the recording-gage station. (Note: The total number of stations in columns 1 and 2 are equal.) The third column for each state shows the number of stations with nonrecording-gage data only.

Figure 3 shows the location of the 1,030 recording stations used in this study. The length of record indicated is for the longest available record and includes the period where only a nonrecording gage may have been located at the particular station. Figure 4 shows the location of the 2,292 nonrecording gages that, together with the recording gages, were used to provide data to define the 24-hr isopluvial pattern. A few additional stations with records of less than 10 yrs were used to provide guidance for estimating the precipitation pattern in extremely mountainous regions where no other data were available. Most of the data were for observation days. Empirical adjustments were used to convert statistical analyses of these data to the equivalent of 1,440-min data.

Table 1. *Number of precipitation stations by length and type of record in each Western State*

Years of record	State																																	
	Arizona			New Mexico			Colorado			Utah			Wyoming			Montana			Idaho			Washington			Oregon			Nevada			California			Total				Percent			
	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	RGR	TR	NR	Stns.	RGR	TR	NR	Total
10-14	6	5	38	29	10	33	18	18	28	13	8	20	23	16	31	29	22	78	19	18	10	31	20	19	26	19	33	11	6	10	98	95	209	303	237	509	812	29.4	23.0	22.2	24.4
15-19	9	8	28	8	16	34	14	11	29	2	0	11	2	1	11	5	3	19	2	1	7	4	2	13	3	3	13	6	5	5	37	35	92	92	85	262	354	8.9	8.3	11.4	10.6
20-24	23	12	30	34	12	36	52	36	31	18	9	16	31	20	14	59	50	23	3	2	5	15	14	21	15	15	29	6	7	6	47	42	132	303	219	343	646	29.4	21.3	15.0	19.4
25-29		1	15		7	15		3	15		2	7		3	7		2	15	16	10	11	37	25	8	50	36	30	15	5	4	140	114	97	258	208	224	482	25.0	20.2	9.8	14.5
30-34		1	9		3	15		3	7		1	7		1	8		2	14		2	7		1	19		3	25		3	3	53	54	59	53	74	173	226	5.1	7.2	7.6	6.8
35-39		2	10		3	11		0	9		4	4		2	6		2	9		1	4		4	19		4	11		1	3	14	18	43	14	41	129	143	1.4	4.0	5.6	4.3
40-44		6	53		2	16		2	10		1	9		1	8		1	8		0	10		4	12		0	9		0	2	5	15	70	5	32	207	212	0.5	3.1	9.0	6.4
45-49		0	1		4	16		0	10		0	5		3	8		1	5		0	15		3	8		1	4		5	3	0	2	16	0	19	91	91	0.0	1.8	4.0	2.7
50-54		1	1		5	13		4	12		2	13		2	6		5	11		1	14		4	15		2	10		2	4	0	1	13	0	29	112	112	0.0	2.8	4.9	3.4
55-59		1	4		8	14		2	7		1	3		5	8		1	9		4	8		0	9		4	6		0	5	0	3	13	0	29	86	86	0.0	2.8	3.8	2.6
60-64		0	1		1	3		0	6		2	14		0	5		4	3		0	6		3	4		1	2		1	2	1	6	13	1	18	59	60	0.1	1.7	2.6	1.8
65-69		1	1		0	4		1	8		3	4		2	2		0	1		1	3		7	8		3	7		3	2	0	2	19	0	23	59	59	0.0	2.2	2.6	1.8
70-74								4	6														0	1		3	1				0	8	21	0	15	29	29	0.0	1.5	1.3	0.9
75-79																															0	0	4	0	0	4	4	0.0	0.0	0.2	0.1
80-84																															1	1	4	1	1	4	5	0.1	0.1	0.2	0.2
85-89																																0	0		0	0	0	0.0	0.0	0.0	0.0
90-94																																0	1		0	1	1	0.0	0.0	0.0	0.0+
Number:																																									
By type	38		191	71		210	84		178	33		113	56		114	93		195	40		100	87		156	94		180	38		49	396		806	1,030		2,292	3,322				
Total stns	229			281			262			146			170			288			140			243			274			87			1,202			3,322							
Percent:																																									
By type	3.7		8.3	6.9		9.2	8.2		7.8	3.2		4.9	5.4		5.0	9.0		8.5	3.9		4.4	8.4		6.8	9.1		7.9	3.7		2.1	38.4		35.1								
Total stns	6.9			8.4			7.9			4.4			5.1			8.6			4.2			7.3			8.2			2.6			36.1										

Note: RGR = stations having recording-gage record.
TR = stations having recording gage for part of the record; total record includes both recording- and nonrecording-gage record.
NR = stations having only nonrecording-gage record.

Data tabulations. The maximum observed 24-hr (and 1- and 6-hr for recording gages) precipitation amount for each month was tabulated for each station. The maximum amount for each year of record was determined from these maximum monthly amounts. In the tabulations, data for some stations were missing or of questionable reliability for all or part of one or more years. For each such case, the data were evaluated individually to obtain the maximum length of record for the station. For instance, if data for a few months were missing, the maximum amount recorded for the remainder of the year was used to determine the maximum yearly amount if it appeared reasonable when compared with other years and with the maxima for that year at surrounding stations. This could result in an underestimation of the accepted amount, but it is felt that such errors are small and of little consequence.

Every effort was made to keep spurious data to a minimum. Reports of unusually large amounts at a station, or of large amounts at one station surrounded by stations reporting little or no precipitation, were examined to determine whether these large amounts were meteorologically reasonable. Cool season data were examined to ascertain if unusually large amounts were depth of snow rather than its water equivalent. However, not all large amounts were examined, nor could conclusive determinations be made regarding all of the large amounts that were examined. It is believed that most of the spurious data have been corrected.

Frequency Analysis

Two types of series. There are two methods of selecting data for analysis of extreme values. The first method produces the annual series. This method selects the largest single event that occurred within each year of record. In the annual series, year may be calendar year, water year, or any other consecutive 12-mo period. The limiting factor is that one, and only one, piece of datum is accepted for each year. The second method of selecting data produces the partial-duration series. This method recognizes that large amounts are not calendar bound and that more than one large event may occur in the time unit used as a year. In a partial-duration series, the largest N events are used regardless of how many occur in the same year; the only restriction is that independence of individual events be maintained. The number of events used is at least equal to the number of years of record.

One requirement in the preparation of this Atlas is that the results be expressed in terms of partial-duration frequencies. To avoid the laborious processing of partial-duration data, the annual series data were collected and analyzed and the resulting statistics were transformed to partial-duration statistics.

Conversion factors between annual and partial-duration series. Table 2 gives the empirical factors used to multiply partial-duration series analysis values to obtain the equivalent annual series analysis values. It is based on a sample of about 200 widely scattered first-order Weather Bureau stations. Only about one-fourth of these stations are in the western United States. The factors used in table 2 were taken from *Weather Bureau Technical Paper* No. 40. Reciprocals of these factors were used to convert the statistics of the annual series to those of the partial-duration series.

These relations have also been investigated by Langbein (1949) and Chow (1950) with equivalent results. The quality of the relation between the mean of the partial-duration series and that of the annual series data for 6- and 24-hr durations is shown in figure 5. The means for both series are equivalent to the 2.3-yr return period. Tests for samples of from 10 to 50 yrs of record length indicate that the factors of table 2 are independent of the record length.

Return period	Conversion factor
2-yr	0.88
5-yr	0.96
10-yr	0.99

Table 2. *Empirical factors for converting partial-duration series to annual series*

Frequency distribution. The frequency distribution used was the Fisher-Tippett Type I distribution; the fitting procedure was that developed by Gumbel (1958). This distribution and fitting procedure were used by the National Weather Service in previous studies of short-duration precipitation values (U.S. Weather Bureau 1953, 1954a, 1954b, 1955a, 1955b, 1956, 1957–60, and 1961). Studies by Hershfield and Kohler (1960) and Hershfield (1962) have demonstrated the applicability of this distribution to precipitation extremes. The distribution was fitted by the method of moments. The 2-yr value measures the first moment, the central tendency of the distribution. The relation of the 2-yr to the 100-yr value is a measure of the second moment, the dispersion of the distribution. The 2-yr and 100-yr precipitation can be used for estimating values for other return periods.

The return-period diagram, figure 6, taken from *Weather Bureau Technical Paper* No. 40, is based on data from National Weather Service stations having long records. The spacing of the vertical lines on the diagram is partly empirical and partly theoretical. From 1- to 10-yr return periods, it is entirely empirical, based on freehand curves drawn through plottings of partial-duration series data. For 20-yr and longer return periods, reliance was placed on the Gumbel procedure for fitting annual series data to the Fisher-Tippett Type I distribution. The transition was smoothed subjectively between the 10- and 20-yr return periods. If

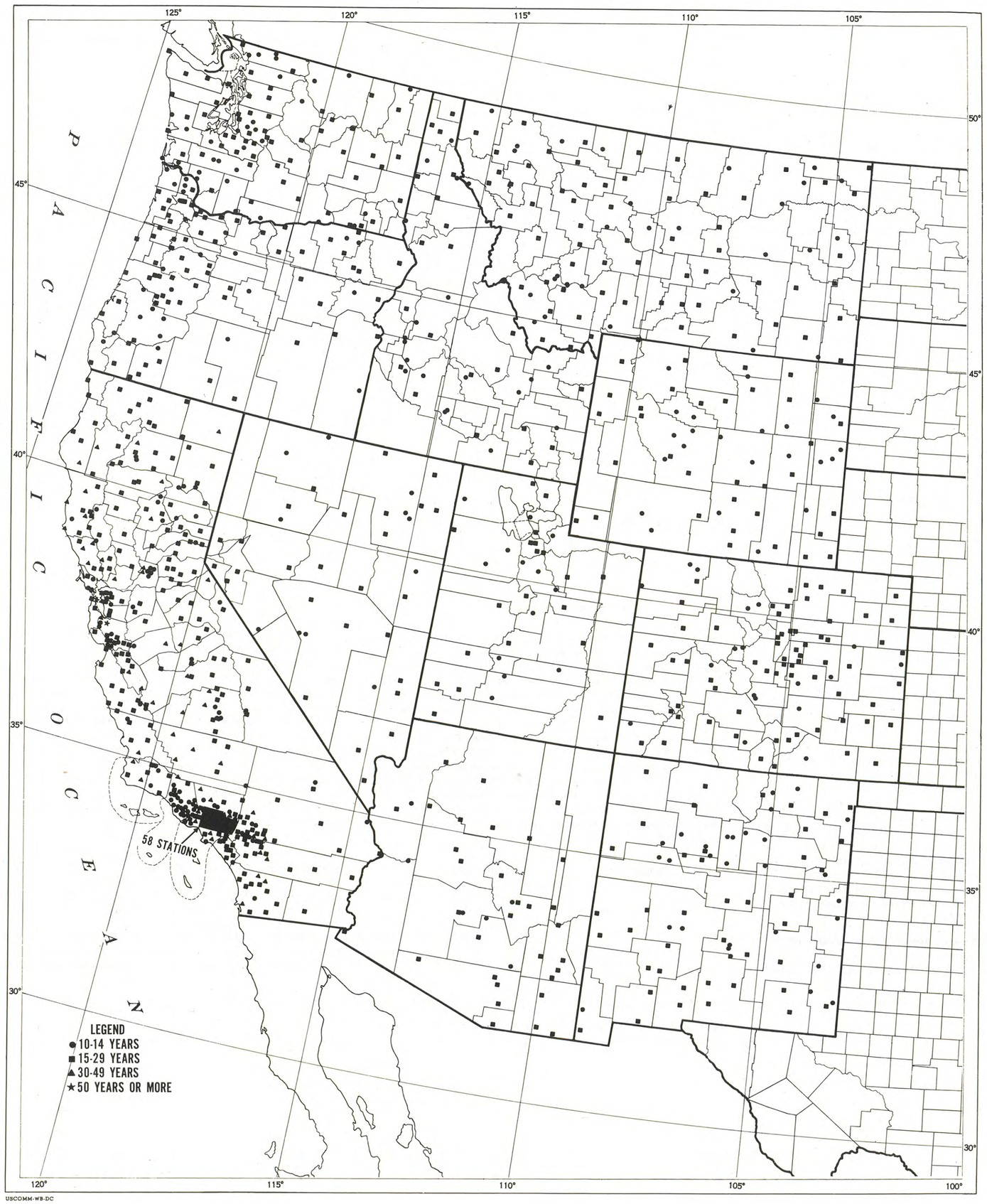


Figure 3. *Geographic distribution of stations with recording gages. Symbols indicate total length of record available.*

precipitation values for return periods between 2 and 100 yrs are desired, it is necessary to obtain the 2- and 100-yr values from this series of generalized precipitation-frequency maps. These values are then plotted on the appropriate verticals and connected with a straight line. The precipitation values for the intermediate return periods are determined by reading values where the straight line intersects the appropriate verticals. If the rainfall values are then converted to the annual series by applying the factors of table 2 and plotted on either Gumbel or log-normal graph paper, the points will very nearly approximate a straight line.

Isopluvial Maps

Methodology. The factors considered to determine the sequence of preparation of the basic isopluvial maps for this series of generalized precipitation-frequency maps were (1) availability of data, (2) reliability of estimates for the return period, and (3) range of durations and return periods. Because of the large amount of data for the 24-hr duration and the relatively small standard error associated with the 2-yr values, a map showing such data was selected for preparation as the basic map for this series. The second map was prepared for the 24-hr duration and 100 yrs, the longest return period of interest. Next, the 2-yr 6-hr and the 100-yr 6-hr precipitation maps were prepared. These four key maps envelop the range of durations and return periods required and provide the data to be used for obtaining values for four intermediate return period maps at each duration.

Development of relations for interpolating precipitation-frequency values. The adequacy of the basic data network for determining precipitation-frequency values varies from place to place within the western United States. The greatest station density occurs along the Pacific coast west of the Cascade and Sierra Nevada Ranges (figs. 3 and 4). The lowest densities are in the intermountain plateau—between the Cascade-Sierra Nevada ranges and the Continental Divide—particularly in Nevada and in the Salmon River Mountains of Idaho. Even within particular regions, the stations are not evenly distributed. Most of the stations are located in the coastal plains, the river valleys, the western portion of the Great Plains, and the lower foothills of the mountains. Relatively few stations are located on steep slopes or on crests of mountains, in sparsely populated areas, or in areas where access is difficult.

It is desirable, therefore, to develop relations that can be used in interpolating precipitation-frequency values between stations in regions where data are relatively scarce. A preferred method is to relate variations in precipitation-frequency directly to variations in topographic factors; this is done when an adequate relation can be developed. The primary advantage of this procedure is that topographic factors can be determined at any point in a region. Topographic maps can be prepared from aerial photographs or surveys, or by other methods that do not require observations taken at a fixed point over a period of time. Among topographic factors frequently considered are: (1) elevation of the station, either the actual elevation or some effective elevation (an average elevation determined along a circle of a given radius around the station); (2) slope of the terrain near the station, both in the small and large scales; (3) distances from both major and minor barriers; (4) distances and directions from moisture sources; and (5) roughness of the terrain in the vicinity of the station.

It has not been possible to develop such relations for all regions. Hence, it also was necessary to develop relations that included climatological or meteorological factors. The factors selected for use must be available at locations where precipitation data for durations of between 1 and 24 hrs are not available. Otherwise, they would not provide additional information needed for use in interpolating between locations with frequency values. An example of such a factor is normal annual precipitation. In the construction of such a map, data from snow courses, adjusted short records, and storage gages that give weekly, seasonal, or annual accumulations of precipitation can be used. Such records do not yield the short-duration precipitation amounts necessary for this study. Thus, normal annual precipitation data, particularly because it provides greater areal coverage in mountainous regions, might be of definite use in developing the patterns of the precipitation-frequency maps.

Several other meteorologic factors can be used in combination with normal annual precipitation data and topographic factors to interpolate short-duration precipitation-frequency values at intermediate points. Examples of such factors are: (1) number of thunderstorm days, (2) number of days or hours with precipitation above a threshold value, (3) percentage frequencies of various wind directions and speeds, and (4) percentage frequencies of class intervals of relative humidity. Since these factors can be obtained only where there are recording meteorological gages or where there are observers to record the data they do not supplement the available short-duration precipitation-frequency values by providing data at additional sites.

It would have been desirable to develop a single equation, utilizing physiographic factors, to interpolate between locations with short-duration precipitation-frequency values for the western United States. Such an equation could not be developed, so relations for interpolating the precipitation-frequency values were developed for each of several smaller regions considered to be meteorologically homogeneous. The extent of each region was determined from consideration of the weather situations that could be expected to produce large precipitation amounts. Among the questions asked and answered were: What is the source and from what direction does moisture for major storms come and are there major orographic barriers that influence the precipitation process? Figure 7 shows some of the principal paths of moisture inflow for the western United States and the major orographic barriers to such inflow.

The regions selected for their homogeneity normally are river basins or combinations of river basins. The river basins selected were usually bounded by major orographic barriers that significantly influence the precipitation regime. The size of these regions varied, partly because of meteorologic and topographic considerations and partly because of the availability of data. Some regions included more variability in topographic and meteorologic factors than was ideal. Efforts made to reduce the size of the regions were not successful because sample sizes decreased to less than acceptable limits.

After the geographic regions were selected, various topographic factors that could cause variation of precipitation-frequency values within limited regions such as slope, elevation, roughness, and orientation were examined. Individual precipitation-frequency values and exposures around the stations were examined to gain insight into topographic factors that could be im-

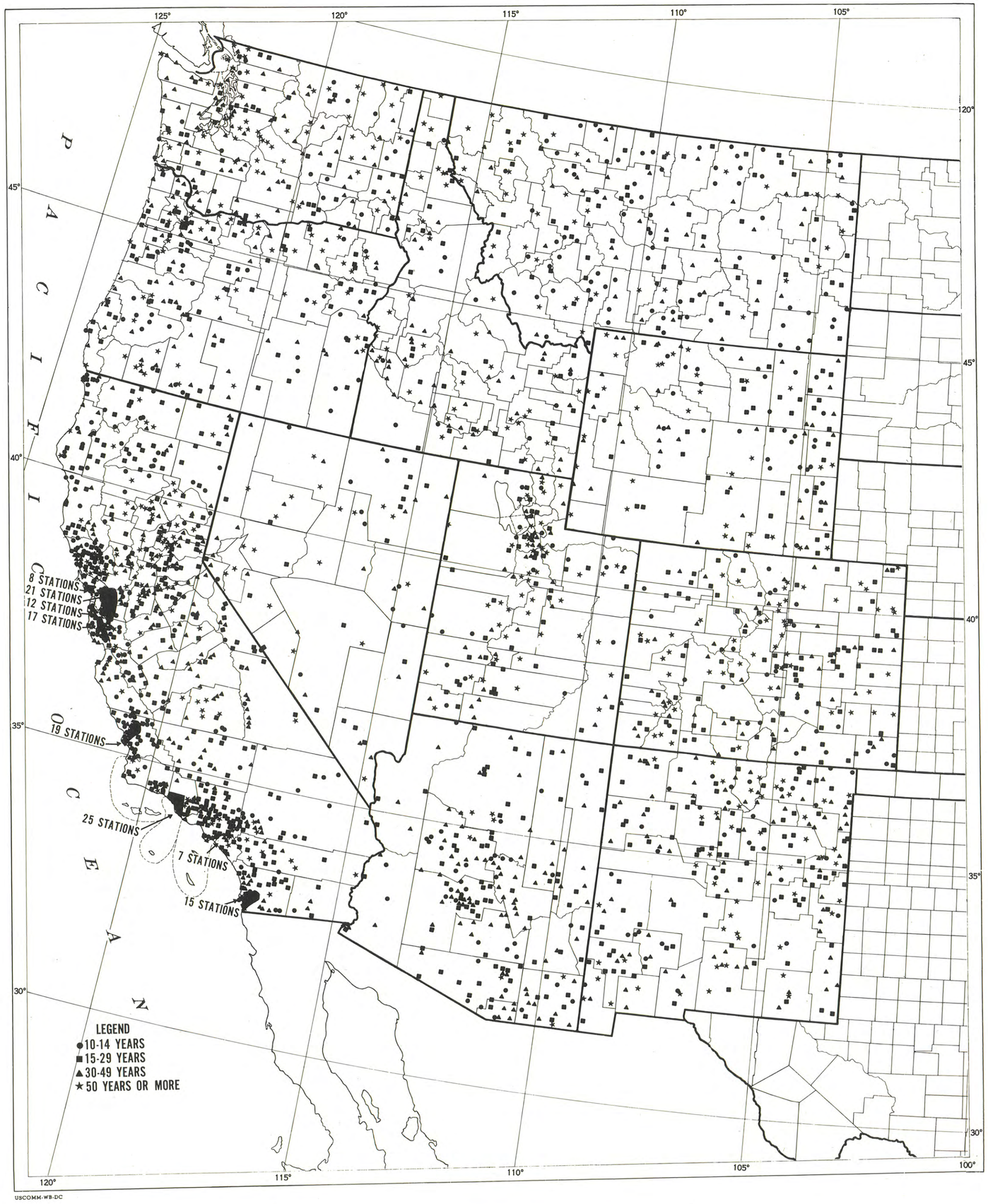
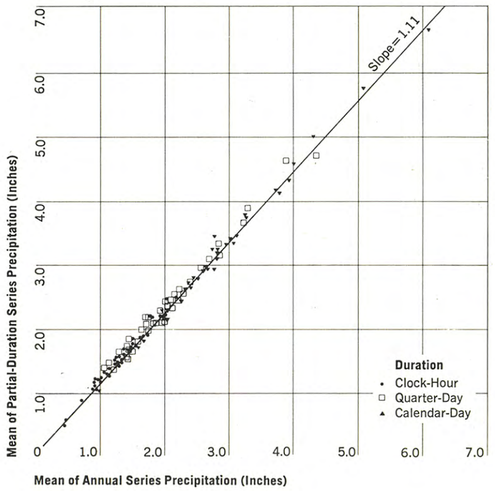


Figure 4. *Geographic distribution of stations with nonrecording gages. Symbols indicate total length of record available.*

Figure 5. *Relation between annual and partial-duration series.*



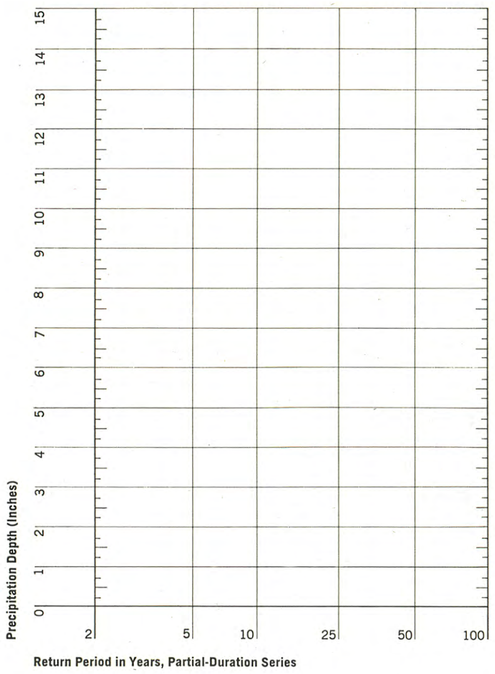


Figure 6. *Precipitation depth versus return period for partial-duration series.*

Figure 7. *Principal paths of moisture inflow in the western United States for storms producing large precipitation amounts. Toned areas are major orographic barriers.*

portant. Next, an examination was made of factors that combined topographic and meteorologic considerations, such as distance and direction to moisture sources. Each factor considered was a measure of some physical reality, and each was understandably related to variation in the precipitation-frequency regime.

Finally, various climatological and meteorological factors that could be indexes of variation of the precipitation-frequency values were considered. The procedure used for developing interpolating equations was a multiple-regression screening technique. This process was done by computer using a least-squares technique. The computer program was capable of accepting a total of 174 independent variables for as many locations as data were available. The number of variables screened for the various relations ranged between 60 and 100. This does not mean that 60 or more completely different factors could be identified. For example, several factors might involve different measures of slope. Moreover, these measures of slope might be over different distances or have different orientations. In each instance, the practice was to permit the computer to select the most critical of the various measures of each factor.

Although the computer program treated each variable as linear during the regression analysis, it was possible through internal computations to use logarithms, powers, roots, reciprocals, or combinations of any or all of the factors. The computer program selected the single variable most highly correlated with the precipitation-frequency value under investigation. The next step was to select the variable that, combined with the variable already selected, would explain the greatest variation in the precipitation-frequency values. The third, fourth, fifth, and further variables were selected in a similar manner. The program continued to select

Region of applicability[1]	Corr. coeff.	No. of stations	Mean of computed stn. values (inches)	Standard error of estimate (inches)
Gila, Williams, and lower Colorado River Basins (1)	0.84	86	1.86	0.21
Little Colorado, San Juan, and Virgin River Basins, except higher elevations of south-facing slopes (2)[2]	0.81	105	1.36	0.20
Higher elevations of south-facing slopes of Little Colorado, San Juan, and Virgin River Basins (2)[2]	0.93	41	1.31	0.13
Rio Grande Basin north of El Paso, Tex. (3)	0.77	110	1.35	0.18
Crest of Continental Divide and Sangre de Cristo Mountains to generalized 7,000-ft contour from southern Wyoming to southern tip of Sangre de Cristo Mountains (4)	0.83	122	1.43	0.22
Upper Colorado and Gunnison River Basins and Green River Basin below confluence of Green and Yampa Rivers (5)	0.79	69	1.12	0.13
Yampa River Basin, Green River Basin above confluence of Green and Yampa Rivers, and Bear River Basin east of Wasatch Mountains (6)	0.83	29	1.03	0.08
Mountains of central Utah (7)	0.85	86	1.35	0.18
Western Utah and Nevada, except Snake and Virgin River Basins and spillover zone east of Sierra Nevada Crest (8)[3]	0.71	79	1.03	0.13
Western Utah and Nevada, except Snake and Virgin River Basins and spillover zone east of Sierra Nevada crest (8)[3]	0.71	55	1.04	0.15
Big Horn River Basin above Saint Xavier and minor portions of North Platte, Powder, Tongue, and Yellowstone River Basins (9)	0.78	55	1.25	0.21
Upper Missouri River Basin above Holter Dam, Mont.; Snake River Basin above Alpine, Wyo.; and upper Yellowstone River Basin above Springdale, Mont. (10)	0.76	57	1.19	0.16
From generalized 4,000-ft contour on east to crests of Crazy and Little Belt Mountains and Lewis Range on west (11)	0.80	52	1.67	0.26
West of Continental Divide, but east of Bitteroot Range and Cabinet and Selkirk Mountains (12)	0.85	44	1.36	0.12
Mountainous region of eastern Washington and Oregon and of Idaho west of Bitteroot Range crest and Continental Divide, and north of southern boundary of Snake River Basin—excluding Snake River Valley below a generalized 5,000-ft contour (13)	0.78	147	1.44	0.24
Orographic region east of crest of Cascade Range and west of Snake River Basin (14)	0.90	115	1.75	0.35
Western slopes of Coast Ranges, Olympic Mountains, and Cascade Range (15)	0.87	125	3.69	0.48
Eel River Basin; southern portion of Klamath River Basin; and Cottonwood, Elder, Thomas, and Gladstone Creeks (16)	0.91	39	4.19	0.50
Russian River, Cache and Putah Creeks, and coastal drainages west of Russian River (17)	0.84	63	5.31	0.78
Santa Cruz Mountains and La Panza, Santa Lucia, and Coast Ranges (18)	0.95	55	4.32	0.45
Diablo, Gabilan, and Temblor Ranges (19)	0.82	58	2.21	0.35
San Rafael, San Bernardino, Santa Monica, and San Gabriel Mountains (20)	0.88	149	3.98	0.59
Santa Ana, Santa Rosa, Coyote, and other extreme southern coastal mountains (21)	0.88	34	2.44	0.33
Northern Sierra Nevada north of Mokelumne River Basin (22)	0.92	84	4.56	0.53
Southern Sierra Nevada south of Consumnes River Basin (23)	0.88	61	3.43	0.53
Southeastern desert region of California (24)	0.89	41	1.07	0.16
Spillover zone east of Sierra Nevada crest (25)	0.94	41	2.05	0.27
Spillover zone east of crest of coastal mountains of southern California (26)	0.97	10	2.08	0.15

[1] Numbers in parentheses refer to geographic regions shown in figure 8.
[2] Two different equations were used in region 2. See text for explanation.
[3] Two different equations were used in region 8. See text for explanation.

Table 3. *Statistical parameters for relations used for interstation interpolation of 2-yr 24-hr precipitation values*

variables until the variance explained by an additional variable was less than some preselected amount or until a fixed number of variables was selected. Final equations did not contain more than five independent variables.

In the development of these equations, data from all stations with daily or hourly observations were considered. The data sample used was not completely adequate. First, it did not include for each factor the full range of values that occur within the region. Application of the equation, therefore, required unavoidable extrapolation. Second, the number of data points used to develop these equations was occasionally less than desirable. Nevertheless, the equations provided the best available method of developing preliminary estimates of frequency values in regions lacking adequate data.

Relations for interpolating between 24-hr precipitation-frequency data points. Figure 8 shows generalized boundaries of the regions used to develop relations for interpolation between locations with 2-yr 24-hr precipitation values. Topographic maps show recognizable topographic barriers chosen as the boundary lines of most regions. For example, the boundary separating regions 3 and 4 from those to the west is the Continental Divide. The boundary separating region 15 from 14 is the crest of the Cascade Range. A few of the boundaries between adjoining regions may appear somewhat arbitrary, but examination of detailed topographic maps will show a physical basis for each.

In areas where topographic variation is gradual and where there are no large differences in elevations or slopes over short distances, precipitation-frequency values at a station usually are representative of a much larger area than are such values in a mountainous region. Within the western United States, some rather extensive regions met this criteria. Within these regions, there were also numerous stations with suitable records. The lack of topographic controls means only there is limited variation in precipitation-frequency values, and this variation is such that it can be depicted using the numerous station data points. No equations for interpolating between stations were developed for such regions (shown shaded in fig. 8).

The equations developed for interpolating between locations with 2-yr 24-hr precipitation values in regions of sparse data were not all equally reliable. On the average, the 28 equations developed for estimating the 2-yr 24-hr precipitation values at intermediate points in western United States explained about 70 percent of the variance. The standard error of estimate averaged about 13 percent of the average station value for 2-yr 24-hr precipitation. The correlation coefficient, the number of stations used, the average 2-yr precipitation value, and the standard error of estimate for each equation used to estimate 2-yr 24-hr precipitation values are shown in table 3.

The equation that explained the least variance, only slightly over one-half, was for western Utah and most of Nevada (region 8, fig. 8). This is a region with diverse topography and no well-defined orographic barrier. It is also a region where a wide variety of storms produce large precipitation amounts. The equation developed for the coastal mountains of California (region 18, fig. 8) explained the greatest portion of the variance, about 90 percent. The region consists primarily of mountain ranges oriented north-northwest to south-southeast; within this region, large precipitation amounts generally result from one storm type.

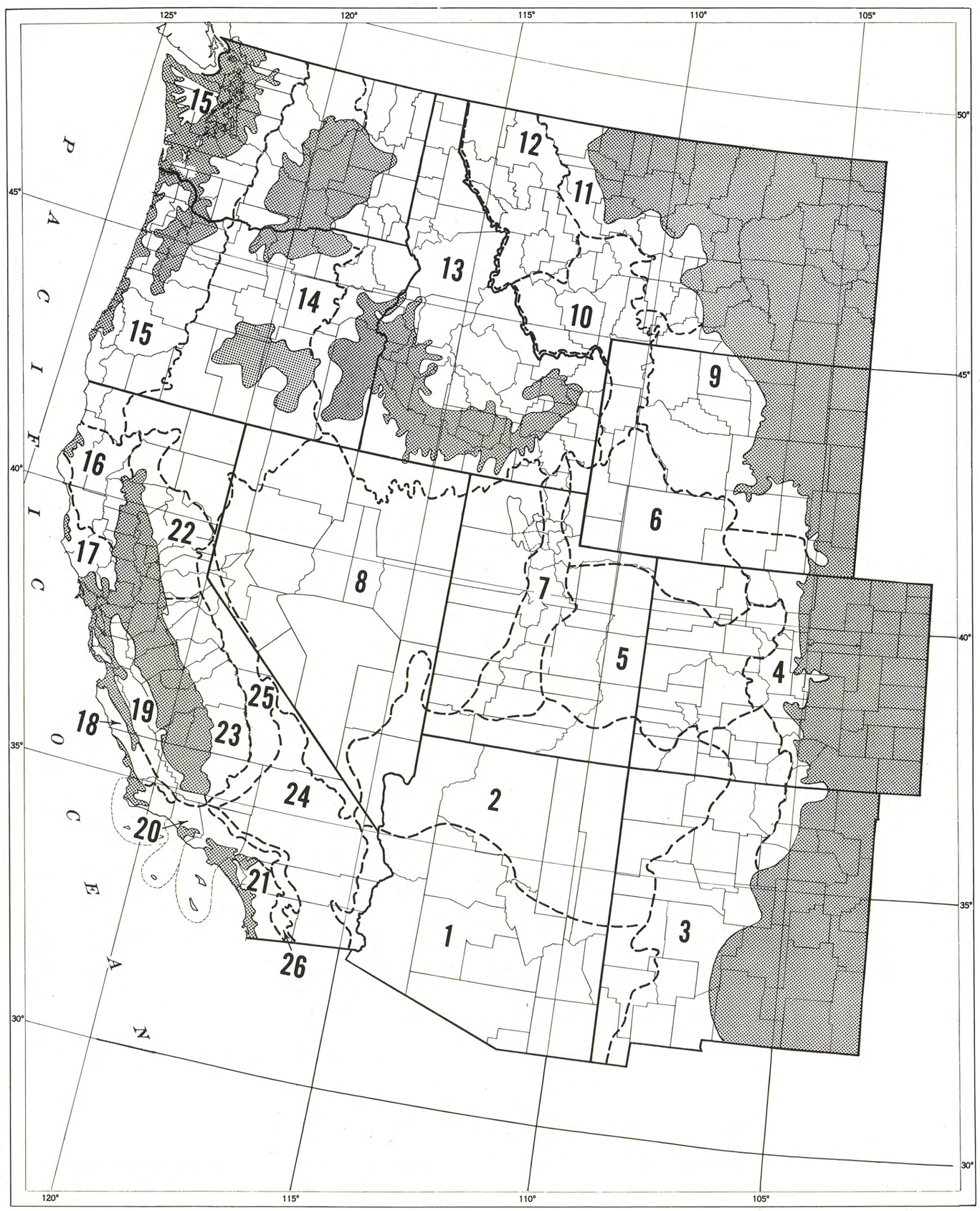


Figure 8. *Regions used to develop statistical parameters for interstation interpolation of 2-yr 24-hr precipitation values.*

Table 4. *Factors most useful in relations for interstation interpolation for 2-yr 24-hr precipitation values*

Factors (by category)	Number of equations using factor	Percent of equations using factor	Number of times each factor used	Percent of total number of times each factor used
Slope	18	64	37	42
Normal annual precipitation	15	54	15	17
Barrier to airflow	10	36	11	12
Elevation	10	36	10	11
Distance to moisture	9	32	9	10
Location (latitude or longitude)	4	14	5	6
Roughness	2	7	2	2

Two equations were developed for region 8 (fig. 8), which includes western Utah and Nevada except for the Snake and Virgin River Basins and a spillover zone east of the Sierra Nevada. The two relations had nearly equal correlation coefficients and standard error of estimates. The first equation was developed using normal annual precipitation, the second topographic factors only. The equation using normal annual precipitation data was developed during preparation of maps for Utah because reliable normal annual precipitation maps were available. Investigations continued, and a relation that gave about equally reliable results was obtained during the development of the maps for Nevada. Values computed using both equations for points near the Nevada-Utah border showed results that did not differ greatly. The second equation was then used to prepare the maps for Nevada.

Table 4 shows the factors, grouped in general categories, found most useful in depicting variations in the 2-yr 24-hr precipitation values for the western United States. The first and second columns show the number and percent of equations in which each factor was used. The total for the second column is larger than 100 percent because several factors were used in the equations developed for each region. The third column shows the total number of times each factor was used, and the fourth what percentage each factor used was of the total number of factors. For example, of the 89 different factors used in the 28 equations, 37 were some measure of slope; the use of the slope factor represents 42 percent of the total number of factors used.

The single most important factor considered was slope, a topographic factor. Measurement of slope varied from region to region. In some regions, slope was measured directly by dividing the difference in height between two points by the distance between the points. In the Cascade and Coast Ranges of Washington and Oregon, the difference between the station elevation and the average elevation at a distance of 20 miles in the western quadrant proved to be the most significant factor. A less direct measure was used in north-central Wyoming and south-central Montana, where the greatest change in elevation between the station and the lowest point within 20 miles was used and the distance between the station and such a point was not involved. In several portions of California, a more complicated method was used. A path 5 miles wide was oriented along the prevailing direction of moist airflow. At 1-mi intervals along this path, the average height was measured. The difference in height between adjoining lines indicated whether there was an upslope or a downslope in this particular segment. The summation of the upslopes and downslopes, separately, was an indirect measurement of slope. A combination of these upslopes and downslopes, each divided by the distance between the station and the center of the area included between two adjoining lines, was a direct measurement of slope.

The second most important topographic factor was found to be the barrier to moist airflow; this factor is actually a combination of meteorology and topography. In selecting a barrier, the first consideration was the direction of moist air inflow. The barrier had to be normal, or nearly normal, to this direction. The barrier range, or ranges, had to be sufficiently massive to cause a significant disruption in the airflow. Barriers of limited lateral extent that would permit air to flow around as easily as over were not considered. A generalized crest line was drawn along the significant barrier, and measurements of barrier height or distances or directions to this barrier were then made from the station to this generalized crestline. The orientation of barriers to moist airflow was determined as appropriate for each region. For example, along the Pacific coast, a westerly direction of moist airflow was used; in Colorado and New Mexico, a southeasterly airflow was appropriate. The direction selected was determined from an examination of the moist air inflow in storms that produce large precipitation amounts in these regions. In some regions, the distance behind the barrier was important. In others, the height of the barrier proved to be more significant.

The distance to the principal moisture source, a combination of topographic and meteorologic influences, was another important factor. In northeastern New Mexico, central Colorado, and southeastern Wyoming (region 4, fig. 8), examination of a topographic map and consideration of the moist air inflow in storms that produced large precipitation amounts (fig. 7), made it evident that the general moist airflow was from the Gulf of Mexico. Distance to moisture was therefore measured in that direction.

Another topographic factor used frequently was the elevation of the station, either the actual station elevation or, preferably, where narrow valleys and ridges predominate in the area the average elevation around the station at some distance (effective elevation). Elevation alone usually correlated rather poorly with precipitation-frequency values. In many regions, the simple correlation between elevation and precipitation-frequency values was not statistically significant at either the 0.01 or 0.05 level. It was not elevation alone but a combination of elevation with other factors, such as slope, height of intervening barriers, and distance to moisture source, that was significant.

Normal annual precipitation was used in many of these index relations. However, the policy adopted was that normal annual precipitation was not used if an equally reliable relation could be derived solely on the basis of topographic factors, even though normals could have been used in almost every region. The one exception was the southeastern desert regions of California, where normal annual precipitation did not correlate well with precipitation-frequency values. Normal annual precipitation maps are most exact at points where data are available. Isopleths used to arrive at estimates in areas where data are not available are only as accurate as the standard error of estimate of the relation used in the interpolation and as the skill of the analyst will permit. Therefore, where estimates of normal annual precipitation (or other climatological factors) are used to develop precipitation-frequency maps, the error incorporated in development of the normal annual precipitation map is combined with the standard error of estimate of the relation for precipitation-frequency maps. Normal annual precipitation maps were, however, helpful and were used. Storage-gage and snow-course data, streamflow data, and vegetation maps are useful for drawing accurate normal annual or seasonal precipitation maps in regions where lack of short-duration precipitation data decreases the reliability of relations between frequency values and topographic factors. Normal annual precipitation was used as a factor where topographic factors could not be quantified to estimate the precipitation-frequency values with sufficient accuracy.

Table 5 shows the statistical parameters of the interpolating equations used to estimate the 100-yr 24-hr precipitation values. The equations were developed for the same regions as those for the 2-yr return period, with one exception (fig. 9). This was in Arizona where data from the Gila, Williams, and lower Colorado Basins were combined with data from the San Juan, Little Colorado, and Virgin River Basins. In regions relatively unaffected by orography, equations were developed that related the 2-yr 24-hr precipitation values to those for the 100-yr return period. These equations were developed as an additional aid for interpolating between stations in these regions because of the relatively few stations with long records available. Although the longest record stations were generally within the nonorographic regions, most states had less than 20 percent of the stations within these regions with 50 or more years of record. Equations for these regions provided an objective method of providing space-averaged ratios between 100-yr 24-hr precipitation values and 2-yr 24-hr precipitation values.

As with the relations for estimating the values for the 2-yr return period, the equations did not all have the same degree of reliability. The orographic region for which the equation accounted for the least variance (not quite one-half of the variation) was the region including the Yampa River Basin, the Green River Basin above the confluence of the Green and Yampa Rivers, and the Bear River Basin east of the Wasatch Mountains (region 5, fig. 9). For several regions in California, over 90 percent of the variance was accounted for by the equations. The equation developed for the San Rafael, San Bernardino, Santa Monica, and San Gabriel Mountains (region 20, fig. 9) accounted for the greatest amount of the variation. On the average, the 35 equations developed to interpolate the 100-yr 24-hr precipitation values in this portion of the United States accounted for about 75 percent of the variance, and the standard error of estimate averaged about 12 percent of the average station value.

There was one region (region 7, fig. 9) for which two equations were developed. In the preparation of frequency maps for Utah, basins that were wholly or partly within Utah were investigated. One region extended westward from Utah to include most of Nevada. Within this region, a relation was developed that accounted for about 60 percent of the variance. During subsequent investigations, a superior relation was developed when frequency maps for Nevada were prepared. The newly developed equation accounted for about 80 percent of the variance.

Table 6 shows the factors found most useful for interpolating variations in the 100-yr 24-hr precipitation values in sparse-data areas of the western United States. This table is in the same format as table 4. The definitions of the variables—slope, distance to moisture, elevation, etc.—are the same as those for table 4. Again, slope is the most important topographic factor. The next most important topographic factor was elevation. In the equations, the 2-yr 24-hr precipitation values were used in interpolation. In table 6, it can be seen that the 2-yr 24-hr precipitation value was the most important variable. However, this may be misleading because about one-fourth of the regions for which equations were developed were considered nonorographic. In such regions, the use of the 2-yr 24-hr precipitation value in an equation was similar to using an average 100- to 2-yr ratio. Frequently, these equations included a location factor that reflected the variation of such a ratio over the region. As with other meteorological or climatological factors—for example, normal annual precipitation—it would have been preferable to avoid the use of precipitation-frequency values in the equations. However, this was not always possible.

Relations for estimating the 6-hr precipitation-frequency values. Data from both recording and nonrecording gages can be incorporated in equations for estimating precipitation-frequency values for the 24-hr duration. For durations of less than 24 hrs, only data from recording gages can be used. This frequently reduces the number of data points within a particular region by one-half or more. The effect of topography on precipitation-frequency values decreases as the duration decreases. Thus, there is less variability in the precipitation-frequency values for the 6-hr duration. For these reasons, larger regions are used to develop interpolation equations for 6-hr duration maps. Figure 10 shows the regions used to develop the equations for estimating 2-yr 6-hr precipitation values. The regions used for developing relations for the 100-yr return period were the same with one exception; the region south of the Snake, Bear, Yampa, and North Platte River Basins (region 1, fig. 10). This region was divided approximately along the Arizona-Utah and the New Mexico-Colorado boundary lines into Regions 1A and 1B.

The equation for the northern Sierra Nevada region of California (region 7, fig. 10) accounted for the least amount of variation—about 60 percent—in the 2-yr 6-hr precipitation values (table 7). The equation for the coastal mountains of California (region 6, fig. 10) accounted for over 90 percent of the variation and was the most reliable equation developed. On the average, the equations accounted for over 80 percent of the variations and had a standard error of estimate of about 11 percent of the average 2-yr 6-hr precipitation values.

For the 100-yr 6-hr precipitation values, the equation for the coastal mountains of California (region 6, fig. 10) accounted for the greatest amount of variation in these values (table 8). In this region, over 90 percent of the variation in the data sample was accounted for. The equation for the northern Great Basin (region 3, fig. 10) accounted for the least variation. In this region, the equation accounted for about 60 percent of the variation. On the average, the equations accounted for over 80 percent of the variation with a standard error of estimate of about 14 percent of the

Region of applicability[1]	Corr. coeff.	No. of stations	Mean of computed stn. values (inches)	Standard error of estimate (inches)
Gila, Williams, San Juan, Little Colorado, and Virgin River Basins (1)	0.80	148	3.98	0.59
Rio Grande Basin north of El Paso, Tex. (2)	0.78	110	3.26	0.48
Crest of Continental Divide and Sangre de Cristo Mountains to generalized 7,000-ft contour from southern Wyoming to southern tip of Sangre de Cristo Mountains (3)	0.91	69	3.28	0.38
Upper Colorado and Gunnison River Basins and Green River Basin below confluence of Green and Yampa Rivers (4)	0.79	53	2.57	0.31
Yampa River Basin, Green River Basin above confluence of Green and Yampa Rivers, and Bear River east of Wasatch Mountains (5)	0.68	27	2.41	0.30
Mountains of central Utah (6)	0.88	65	2.84	0.25
Western Utah and Nevada, except Snake and Virgin River Basins and spillover zone east of Sierra Nevada crest (7)[2]	0.77	64	2.50	0.29
Western Utah and Nevada, except Snake and Virgin River Basins and spillover zone east of Sierra Nevada crest (7)[2]	0.90	55	2.42	0.22
Big Horn River Basin above Saint Xavier and minor portions of North Platte, Powder, Tongue, and Yellowstone River Basins (8)	0.94	47	3.10	0.31
Upper Missouri River Basin above Holter Dam, Mont.; Snake River Basin above Alpine, Wyo.; and upper Yellowstone River Basin above Springdale, Mont. (9)	0.88	48	2.68	0.34
From generalized 4,000-ft contour on the east to crests of Crazy and Little Belt Mountains and Lewis Range on the west (10)	0.85	41	3.71	0.44
West of Continental Divide, but east of Bitteroot Range and Cabinet and Selkirk Mountains (11)	0.90	37	2.87	0.20
Mountainous region of eastern Washington and Oregon and of Idaho west of Bitteroot Range crest and Continental Divide, and north of southern boundary of Snake River Basin—excluding Snake River Valley below a generalized 5,000-ft contour (12)	0.87	99	2.74	0.32
Orographic region east of crest of Cascade Range and west of Snake River Basin (13)	0.92	115	3.76	0.61
Western slopes of Coast Ranges, Olympic Mountains, and Cascade Range (14)	0.80	119	7.09	1.13
Spillover zone east of crest of Sierra Nevada (15)	0.91	28	5.39	0.75
Eel River Basin; southern portion of Klamath River Basin; and Cottonwood, Elder, Thomas, and Gladstone Creeks (16)	0.85	26	8.34	1.42
Russian River, Cache and Putah Creeks, and coastal drainages west of Russian River (17)	0.88	35	10.17	1.24
Santa Cruz Mountains and La Panza, Santa Lucia, and Coast Ranges (18)	0.96	26	10.90	1.25
Diablo, Gabilan, and Temblor Ranges (19)	0.97	29	5.26	0.48
San Rafael, San Bernardino, Santa Monica, and San Gabriel Mountains (20)	0.98	68	11.72	0.97
Santa Ana, Santa Rosa, Coyote, and other extreme southern coastal mountains (21)	0.87	29	6.74	1.06
Northern Sierra Nevada north of Mokelumne River Basin (22)	0.96	65	9.74	1.01
Southern Sierra Nevada south of Consumnes River Basin (23)	0.89	42	8.14	1.29
Southeastern desert region of California (24)	0.93	41	3.37	0.47
Spillover zone east of crest of coastal mountains of southern California (25)	0.98	10	6.20	0.50
New Mexico east of Rio Grande Basin (26)	0.66	136	5.28	0.88
Colorado east of generalized 7,000-ft contour, and southeastern Wyoming east of generalized 7,000-ft contour and south of North Platte River Basin (27)	0.82	119	4.73	0.52
Eastern Wyoming and southeastern Montana east of generalized 6,000- to 5,000-ft contour and south of generalized 4,000-ft contour in vicinity of Wyoming-Montana border (28)	0.83	66	4.08	0.45
Montana east and north of generalized 4,000-ft contour (29)	0.76	83	3.86	0.42
Snake River Valley below 5,000 ft (30)	0.85	48	2.25	0.21
Coastal Plain, Puget Sound region, and Williamette Valley below 1,000 ft (31)	0.94	146	5.47	0.62
Nonorographic region east of crest of Cascade Range (32)	0.71	50	2.07	0.25
Sacramento and San Joaquin River Valleys of California below 1,000 ft (33)	0.94	102	4.07	0.51
Coastal lowlands of California (34)	0.87	180	6.65	1.03

[1] Numbers in parentheses refer to geographic regions shown in figure 9.
[2] Two different equations were used in region 7. See text for explanation.

Table 5. *Statistical parameters for relations used for interstation interpolation of 100-yr 24-hr precipiation values*

average 100-yr 6-hr precipitation values.

The factors used most frequently in the equations for estimating the 2-yr 6-hr precipitation values are listed in table 9; those for the 100-yr 6-hr precipitation values are given in table 10. The format and definitions of variables of tables 9 and 10 are the same as those of table 4. For the 2-yr return period, the factor used most frequently was a measurement of slope. Most equations, however, related variations in the 6-hr precipitation values to variations in the 24-hr values. For the 100-yr return period, slope and elevation were equally important topographic factors. As with the 100-yr 24-hr and 2-yr 6-hr maps, precipitation-frequency values were used in the equations for some regions.

Typical multiple linear regression equations. It is beyond the scope of this publication to present all the equations used for estimating precipitation-frequency values for this Atlas. However, it is useful to discuss in some detail two equations used to estimate the 2-yr 24-hr precipitation values. The factors used and the accuracy of the results obtained are typical of other equations developed.

The first of these is the equation for the northern Coastal Mountains of California (region 16, fig. 8). This region includes the Eel River Basin, some southern portions of the Klamath River Basin, and the western portion of the Sacramento River Basin. This equation is

$$Y = 3.117 + 1.814(X_1) + 0.016(X_2) - 0.049(X_3), \quad (1)$$

where Y is the 2-yr 24-hr precipitation value in inches, and X_1 is the average elevation (in hundreds of feet) of the points on a 1-mile radius circle centered on the station and divided by the distance (in miles) to the coast. X_2 is the slope of the terrain near

Table 6. *Factors most useful in relations for interstation interpolation for 100-yr 24-hr precipitation values*

Factors (by category)	Number of equations using factor	Percent of equations using factor	Number of times each factor used	Percent of total number of times each factor used
2-yr 24-hr precipitation	27	77	27	29
Slope	26	74	26	28
Elevation	20	57	20	22
Distance to moisture	6	17	6	7
Location (latitude or longitude)	5	14	6	7
Normal annual precipitation	4	11	4	4
Barrier to airflow	2	6	2	2
Roughness	1	3	1	1

Region of applicability*	Corr. coeff.	No. of stations	Mean of computed stn. values (inches)	Standard error of estimate (inches)
Arizona, New Mexico, extreme eastern California, Nevada south of the Snake River Basin, Utah south of the Snake and Bear River Basins, and Colorado south of the Yampa and North Platte River Basins (1a and 1b)	0.92	262	1.10	0.16
Montana and Wyoming east of a generalized crestline extending along the Continental Divide in northern Montana, the Crazy and Little Belt Mountains, the Absaroka Range, and the Continental Divide in southern Wyoming (2)	0.94	125	1.07	0.10
Region north of the southern boundaries of the Snake, Bear, and Yampa River Basins and between a generalized crestline of the Cascades and a generalized crestline extending along the Continental Divide in northern Montana, the Crazy and Little Belt Mountains, the Absaroka Range, and the Continental Divide in southern Wyoming and northern Colorado (3)	0.91	151	0.73	0.07
Orographic regions of western Washington, Oregon, and California from the crest of the Cascade Range to the Pacific Ocean extending southward to include the area drained by the Klamath and Salmon Rivers in northern California (4)	0.78	57	1.66	0.23
Nonorographic coastal lowlands of Washington and Oregon (5)	0.97	59	1.41	0.10
Coastal mountains of California from the Trinity River Basin in the north to the Mexican border (6)	0.97	87	1.85	0.16
Northern Sierra Nevada north of Mokelumne River Basin (7)	0.78	31	2.03	0.34
Southern Sierra Nevada south of Consumnes River Basin (8)	0.92	26	1.68	0.18
Spillover zone east of the crests of the Sierra Nevada and the coastal mountains of southern California and the southeastern desert region of California (9)	0.86	25	0.84	0.12
Coastal lowlands and San Joaquin and Sacramento Valleys of California (10)	0.95	73	1.37	0.11

* Numbers in parentheses refer to geographic regions shown in figure 10.

Table 7. *Statistical parameters for relations used for interstation interpolation of 2-yr 6-hr precipitation values*

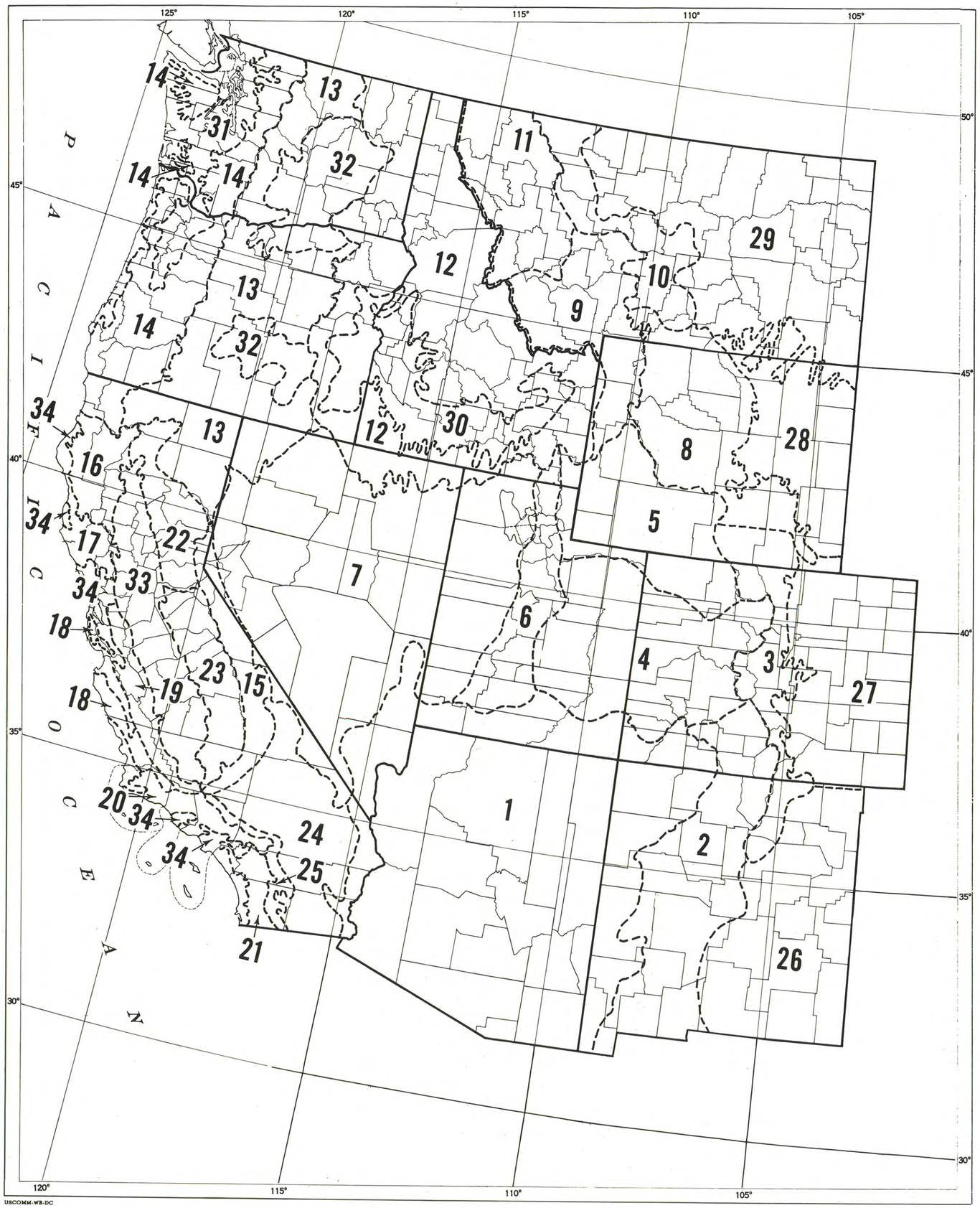


Figure 9. *Regions used to develop statistical parameters for interstation interpolation of 100-yr 24-hr precipitation values.*

the station (in hundreds of feet per mile). X_2 was computed by subtracting the average height along a 90° arc centered 10 miles southwest of the station (downwind for the most prevalent storm-wind direction) from the average height along a 90° arc centered 5 miles northeast of the station (upwind for the most prevalent storm-wind direction). X_3 is the average height (in hundreds of feet) of the final crest (measured along a 10° arc) divided by the distance (in miles) between the station and the final crest. The final crest was a generalized crestline that separated the Sacramento River Basin from basins to the west; it was drawn on a 1:1,000,000 World Aeronautical Chart. Distances to the east of this crest were considered negative.

The first factor, X_1, combines the measurements of the horizontal and vertical distances from moisture. It also measures the average slope between the station and the coast. The second factor, X_2, is a measure of the lift imparted to the airflow in the vicinity of the station—small-scale slope. The third factor, X_3, is a measure of large-scale lifting—large-scale slope. It can also be considered to represent the general distortion in the large-scale moist airflow caused by the major orographic barrier.

This equation explains about 84 percent of the variance in the 2-yr 24-hr precipitation values, with a standard error of estimate of 0.50 in. which is about 12 percent of the average 2-yr 24-hr precipitation value for stations in the region. Of the total variance, the first variable accounts for about 70 percent, the second, 9 percent, and the third, 4 percent. Other variables examined did not account for significant additional portions of the variance. The geographic distribution of the errors is shown in figure 11. The upper number at each station is the actual difference (in hundredths of inches) between the value computed from observed data and that estimated from the equation. The lower number is the error expressed in a percent of the 2-yr 24-hr precipitation value at the station. No discernible regional pattern in the errors was apparent. Although the factors used in this and the other equations have a physical meaning, the equation is a statistical relation of physical factors. There is no intention to imply a cause-and-effect relation. The requisite knowledge of the precipitation process is not yet available to develop equations that incorporate the dynamics of motion, condensation, and other factors to predict precipitation frequency.

The second illustrative equation was developed for the Big Horn River Basin, south of Saint Xavier, Mont. (region 9, fig. 8). Minor portions of the North Platte, Powder, Tongue, and Yellowstone River Basins were also included in this region. The equation is

$$Y = 1.497 + 0.027(X_4) + 0.002(X_5) - 0.023(X_6). \quad (2)$$

Y is the estimated 2-yr 24-hr precipitation value in inches. X_4 is the difference between the station elevation and the lowest elevation within 20 miles (in hundreds of feet). X_5 is the difference between the sum of the maximum heights within 40 miles along radials to the northwest, west, and southwest, and the sum of the maximum elevations within 40 miles along radials to the northeast, east, and southeast (in hundreds of feet). X_6 is the direction to the nearest point on the Continental Divide within the sector from southwest to north. If, however, there is a peak higher than 9,000 ft within this sector and it is closer to the station than is the Continental Divide, X_6 is the direction to this peak.

All three variables are related to the effect of the ground slope in the vicinity of the station. The first two variables measure differences in height over small and medium distances and reflect the importance of the steepness of the slope in the precipitation process. Here, the moist airflow of large storms comes from an easterly direction, frequently associated with a cyclonic center south or southeast of the region, and ground elevation generally increases toward the west or northwest. The third variable relates the orientation of the ground slope and its effectiveness in the precipitation process to an optimum inflow direction. The total amount of the variance accounted for by this relation is about 60 percent, with a standard error of estimate of 0.21 in., or about 17 percent of the average 2-yr 24-hr precipitation value. The first variable accounts for about 41 percent of the variance; the second, 11 percent; and the last, 8 percent. The geographic distribution of the errors from this equation is shown in figure 12.

It would have been possible to include normal annual precipitation in this relation. This factor would have accounted for an additional 15 percent of the variance and a corresponding decrease in the standard error of estimate. Where this factor could be determined from data, the use of normal annual precipitation would have improved the results. As indicated earlier, the results would include some points for which short-duration precipitation data were not available. At points where such data were not available, any improvement would have been dependent on the ability to estimate normal annual precipitation. In using an equation with normal annual precipitation, the standard error of estimate incorporated in the procedure for preparing normal annual precipitation maps is combined with the standard error of estimate for the interpolating equation for 2-yr 24-hr precipitation values. When this combined error is greater than the standard error of estimate for an interpolating equation for 2-yr 24-hr precipitation that does not include normal annual precipitation, there is a loss of accuracy through use of the equation including normal annual precipitation. Within this particular region, the uncertainty in estimating normal annual precipitation at nondata points was sufficiently large and an equation developed using only topographic factors was sufficiently reliable that use of the equation containing normal annual precipitation for estimating the 2-yr 24-hr precipitation values was not justified.

Drawing of isopluvial lines on four key maps. In preparing the isopluvial maps, the computed precipitation-frequency values for all stations were plotted. In addition to the computed values, the width of the confidence band, computed according to standard statistical procedures, was plotted for the 100-yr return-period maps. Values estimated from the equations described in the preceding section were plotted for a latitude-longitude grid with 5-min grid points. The total number of grid points was approximately 47,000. Along the boundaries of each region, values were estimated by the equations applicable to each of the adjoining regions.

In the construction of isopluvial lines, the question arises as to how much the station and grid-point data should be smoothed for the most effective use of the maps. When drawing the isopluvial lines through the field of grid points and station data, the standard error of estimate for the various multiple regression equations and the confidence band about the station data must be considered. Also, smoothing between adjoining regions, where multiple regression equations give somewhat different values at the boundary

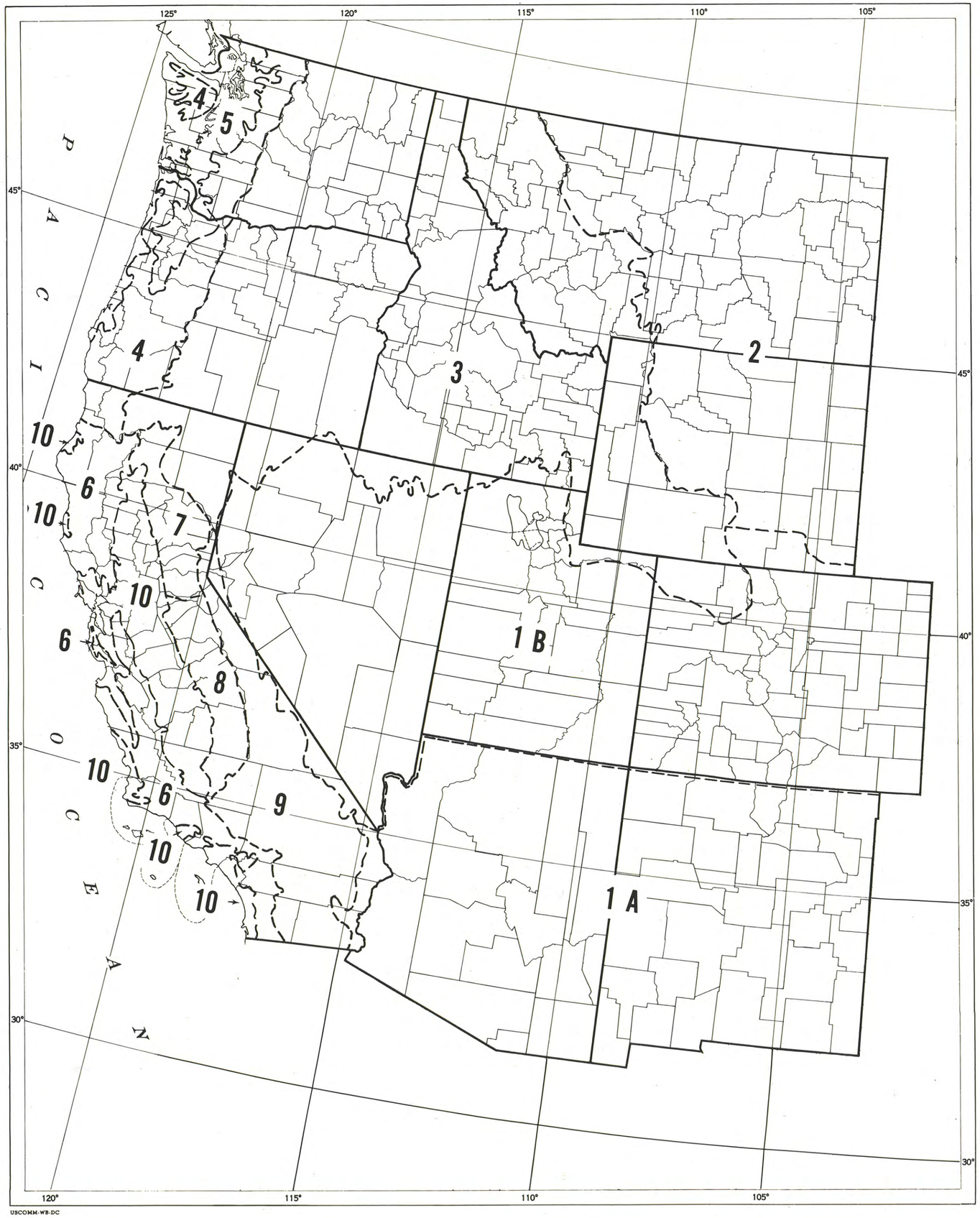


Figure 10. *Regions used to develop statistical parameters for interstation interpolation of 2-yr and 100-yr 6-hr precipitation values.*

Table 8. *Statistical parameters for relations used for interstation interpolation of 100-yr 6-hr precipitation values*

Region of applicability*	Corr. coeff.	No. of stations	Mean of computed stn. values (inches)	Standard error of estimate (inches)
Arizona, New Mexico, and lower Colorado River Basin in southeastern California (1a)	0.91	103	3.16	0.50
Nevada south of the Snake River Basin, Utah south of the Snake and Bear River Basins, and Colorado south of the Yampa and North Platte River Basins (1b)	0.91	144	2.34	0.47
Montana and Wyoming east of a generalized crestline extending along the Continental Divide in northern Montana, the Crazy and Little Belt Mountains, the Absaroka Range, and the Continental Divide in southern Wyoming (2)	0.92	110	2.62	0.31
Region north of the southern boundaries of the Snake, Bear, and Yampa River Basins and between a generalized crestline of the Cascades and a generalized crestline extending along the Continental Divide in northern Montana, the Crazy and Little Belt Mountains, the Absaroka Range, and the Continental Divide in southern Wyoming and northern Colorado (3)	0.79	120	1.62	0.22
Orographic regions of western Washington, Oregon, and California from the crest of the Cascade Range to the Pacific Ocean extending southward to include the area drained by the Klamath and Salmon Rivers in northern California (4)	0.89	57	2.98	0.33
Nonorographic coastal lowlands of Washington and Oregon (5)	0.91	59	2.49	0.31
Coastal mountains of California from the Trinity River Basin in the north to the Mexican border (6)	0.97	87	3.95	0.39
Northern Sierra Nevada north of Mokelumne River Basin (7)	0.93	31	3.81	0.45
Southern Sierra Nevada south of Consumnes River Basin (8)	0.93	26	3.87	0.50
Spillover zone east of the crests of the Sierra Nevada and the coastal mountains of southern California and the southeastern desert region of California (9)	0.84	25	2.29	0.36
Coastal lowlands and San Joaquin and Sacramento Valleys of California (10)	0.87	71	2.98	0.41

* Numbers in parentheses refer to geographic regions shown in figure 10.

Table 9. *Factors most useful in relations for interstation interpolation of 2-yr 6-hr precipitation values*

Factors (by category)	Number of equations using factor	Percent of equations using factor	Number of times each factor used	Percent of total number of times each factor used
Slope	4	40	10	38
2-yr 24-hr precipitation	7	70	7	27
Location (latitude or longitude)	4	40	4	15
Elevation	3	30	3	12
Barrier to airflow	1	10	1	4
Distance to moisture	1	10	1	4

Table 10. *Factors most useful in relations for interstation interpolation for 100-yr 6-hr precipitation values*

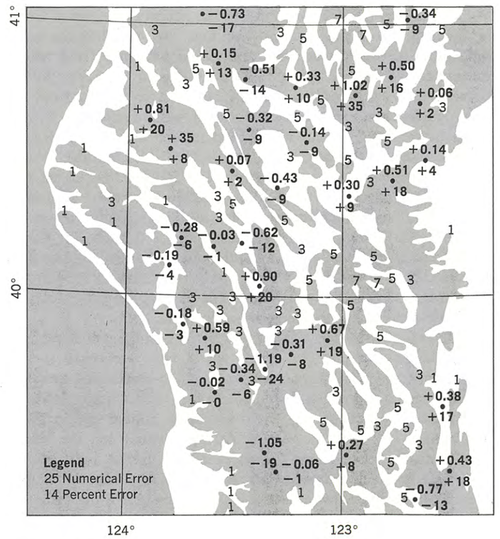
Factors (by category)	Number of equations using factor	Percent of equations using factor	Number of times each factor used	Percent of total number of times each factor used
2-yr 6-hr precipitation	5	55	5	23
100-yr 24-hr precipitation	4	36	4	19
Elevation	4	36	4	19
Slope	4	36	4	19
2-yr 24-hr precipitation	1	9	1	5
Normal annual precipitation	1	9	1	5
Distance to moisture	1	9	1	5
Location	1	9	1	5

lines, must be considered separately. Isolines can be drawn to fit every point plotted on the map, although this would not allow for some of the random differences between adjoining grid points that result from errors in the multiple regression equation or sampling errors in station data. Also, the courseness of even a 5-min latitude-longitude grid is such that sometimes narrow ridges and valleys are missed. Because of these considerations, occasionally it was necessary to make additional computations for such locations. Some subjective smoothing must be used to make allowances for factors that could not be expressed quantitatively.

In analysis, smoothness and closeness of fit are basically inconsistent in that smoothing cannot be carried beyond a certain point without some sacrifice of closeness of fit and vice versa. As the isolines were drawn, the sampling error of the station values and the standard error of estimate were considered.

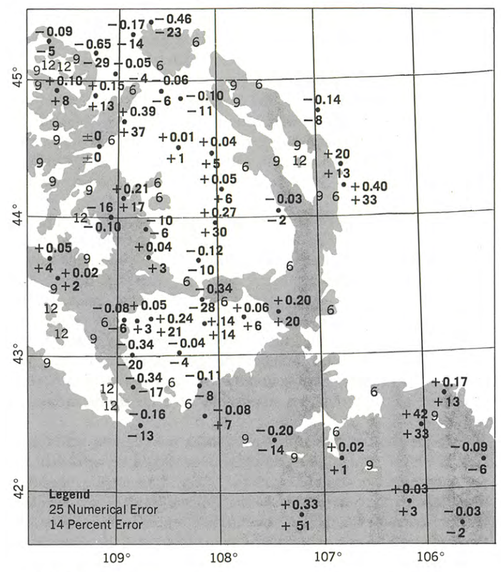
Additional working maps. Additional working maps were prepared showing the 100- to 2-yr ratios for the 6- and 24-hr durations and the 6- to 24-hr ratios for the 2- and 100-yr return periods. To minimize the exaggerated effect of an outlier (anomolous event) from a short record, only data from those stations with a minimum record length of 20 yrs for the 6- and 24-hr durations at the 100-yr return period were used in these working maps. Experience has shown that for long-record station data, the ratio of 6- to 24-hr values for the same return period and the 100- to 2-yr ratio for the same duration do not vary greatly over relatively large areas. The variation present is consistent with the variations in relations between meteorologic and topographic characteristics. Climatic factors that provide general guides on variations of precipitation-frequency values were examined and considered in a qualitative sense. Among these factors are the mean annual number of thunderstorm days (U.S. Weather Bureau 1952, 1947), normal monthly number of days above various threshold values (Environmental Science Services Administration, Weather Bureau, 1966), and mean number of days with rain (Environmental Science Services Administration, Environmental Data Service 1968).

Intermediate maps. The 47,000-point grid described earlier was also used in the analysis of the isopluvial patterns of the eight intermediate maps. These maps—for 5-, 10-, 25-, and 50-yr return periods for 6- and 24-hr durations were prepared primarily for the convenience of the user, because it is technically sufficient to provide two points of the frequency curve for a particular duration and to describe the method of interpolation. Four values, one from each of the four key maps, were read for each grid point. These four values were used in a computer program based on the return-period diagram (fig. 6) to compute values for eight additional maps. The key maps were used as underlays to maintain the basic isopluvial pattern on all maps.



Eel River Basin

Figure 11. *Geographic distribution of errors for equation used to interpolate 2-yr 24-hr precipitation values for the Eel River Basin; southern portion of Klamath River Basin; and Cottonwood, Elder, Thomas; and Gladstone Creeks, California.*



Big Horn River Basin

Figure 12. *Geographic distribution of errors for equation used to interpolate 2-yr 24-hr precipitation values for the Big Horn River Basin above Saint Xavier, Montana; minor portions of the North Platte, Powder, and Tongue River Basins in eastern Wyoming; and minor portions of the Yellowstone River Basin in northwestern Wyoming and southeastern Montana.*

Interpretation of Results

Season of Occurrence

The maps in this Atlas are based upon data for the entire year. In certain sections of the West, precipitation is highly seasonal. Thus, rainy season precipitation-frequency values approach the annual values. In sections where the greatest annual *n*-hour precipitation amount may be observed in any season, seasonal precipitation-frequency maps would differ from those presented in this Atlas. In no case could the seasonal value be greater than the annual value. However, the seasonal values would be a certain percent of the annual values, with the percent varying according to the frequency of large storms during the season under investigation. Generalizations about the seasonal distribution of large storms can be obtained from ESSA, *U.S. Weather Bureau Technical Paper* No. 57 (Environmental Science Services Administration, Weather Bureau, 1966). Currently, there is no convenient manner of applying this knowledge to the maps of this Atlas, other than subjectively.

Within Vs. Among Storms

Data for the various duration maps and diagrams in this Atlas were determined independently; that is, there was no requirement that the maximum 6- or 1-hr amount for a particular year be included within the maximum 24-hr amount for that year. The maps, therefore, represent an "among" storm distribution. In regions where winter-type storms predominate, the 6-hr value for a particular return period would more closely approximate the 6-hr value within the 24-hr storm for the same return period than would generally be the case in regions where convective storms predominate. In a study for the United States east of the Mississippi River, Miller (1971) showed that the ratio between the 2-yr 1-hr value computed from the maximum 1-hr amount within the 24-hr maximum and the 2-yr 1-hr value computed using maximum 1-hr amounts varied between 0.52 and 0.91. Studies have not been undertaken of this relation in the West, but a wide range in such ratios and similar ratios for the 6-hr duration could be expected.

Point Probabilities

The maps in this Atlas are derived from and depict point probabilities; the data points are independent of each other. Precipitation over a region is variable, even in large general area storms; neighboring stations do not necessarily experience maximum annual amounts from the same storm. Thus, the individual points on these maps express individual probabilities. That a point within a particular watershed may receive an amount equal to or greater than its 50- or 100-yr value on a particular day does not affect probabilities for any other point within that watershed. A second point within the watershed may experience an amount equal to or greater than its 50- or 100-yr value within the same storm or on the next day, within the next week or at any other time.

Areal Analysis

A value read from an isopluvial map in this Atlas is the value for that point and the amount for that particular duration which will be equaled or exceeded, on the average, once during the period indicated on the individual map. In hydrologic design, engineers are more concerned with the average depth of precipitation over an area than with the depth at a particular point. Depth-area curves were developed to meet this need. The depth-area curve is an attempt to relate the average of all point values for a given duration and frequency within a basin to the average depth over the basin for the same duration and frequency.

Generally, there are two types of depth-area relations. The first is the storm-centered relation; that is, the maximum precipitation occurring when the storm is centered on the area affected (fig. 13). The second type is the geographically fixed-area relation where the area is fixed and the storm is either centered over it or is displaced so only a portion of the storm affects the area (fig. 13). We can say that storm-centered rainfall data represent profiles of discrete storms, whereas the fixed-area data are statistical averages in which the maximum point values frequently come from different storms. At times, the maximum areal value for the network is from a storm that does not produce maximum point amounts. Each type of depth-area relation is useful, but each must be applied to appropriate data. Generally, the storm-centered relations are used for preparing estimates of probable maximum precipitation, while the geographically fixed relations are used for studies of precipitation-frequency values for basins.

Dense networks of precipitation gages are required to furnish basic data used in developing depth-area relations for fixed areas. The criteria used in selecting dense networks for the determination of areal precipitation-frequencies by the National Weather Service have been:

1. A network should be composed entirely of recording gages. The use of nonrecording gages may greatly increase the number and density of stations within a network, but it involves the construction of mass curves and introduces additional subjectivity. Nonrecording gages are read at various hours, usually early morning, late afternoon, or midnight. Because of conflicting activities, a cooperative observer may not always be able to read his precipitation gage at the exact hour specified. In these cases, the exact time of the observation may not be available, so it is hard to relate the reported amounts to those of surrounding stations with the precision required for development of depth-area relations.
2. A minimum length of record should be established to ensure a reasonable estimate of the 2-yr areal precipitation.
3. Gage locations and exposures should remain consistent during the period of record analyzed.
4. Gages should be located so that there is at least one gage located within each 100 square-mile area.

The average depth-area curves in this Atlas (fig. 14) are for fixed areas and were developed from dense networks meeting the above criteria. The curves were first prepared for an earlier study (U.S. Weather Bureau 1957–60) and have since been rechecked against longer record data; no changes were needed. Application of these curves must be consistent with the manner in which they were developed. The following steps are used:

1. Estimate point values from a grid of many points over the basin of interest for the duration and return period required.
2. Compute an average of the point values obtained in step 1.
3. Use figure 14 to obtain an areal reduction factor required for the precipitation duration and size of area under consideration.
4. Multiply the average value obtained in step 2 by the ratio obtained in step 3. The value obtained in this step provides the areal value for the basin of interest for the duration and return period under consideration.

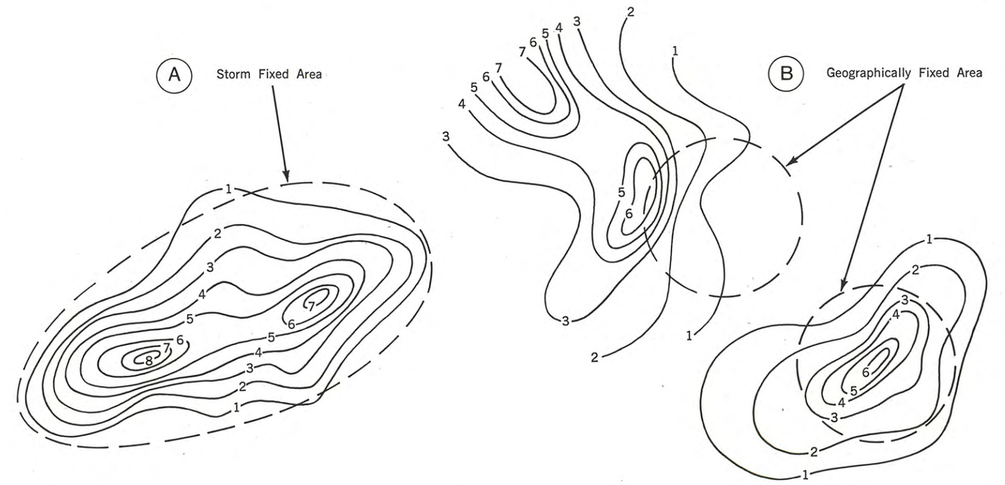


Figure 13. *Examples of (A) isohyetal pattern centered over basin as would be the case for storm-centered depth-area curves and (B) two possible occurrences of isohyetal patterns over a geographically fixed area as would be the case in development of curves for a geographically fixed area.*

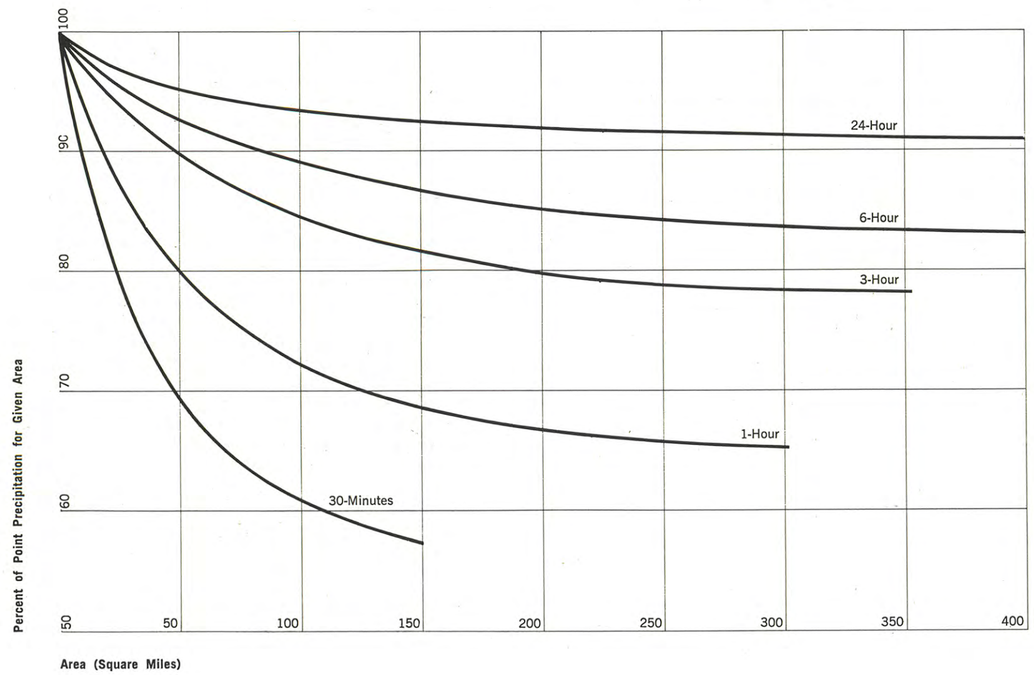


Figure 14. *Depth-Area curves.*

Data used to develop and validate the curves of figure 14 exhibited no systematic regional pattern. Duration turned out to be the major factor. The curves shown are based on data for the 2-yr return period. Within the accuracy of the data available, it could be shown that neither magnitude nor return period was a significant factor.

Importance of Snow in Estimating Frequency Values

The contribution of snow amounts to the precipitation-frequency values for durations of 24 hours or less has been investigated in most of the western United States. In many parts of this region, particularly at higher elevations, snow accounts for over 50 percent of the normal annual precipitation. Thus, the importance of snowfall to short-duration (6- to 24-hr) precipitation-frequency values is of interest for a more complete understanding of the precipitation-frequency regime.

Mean annual precipitation containing a high percentage of snow occurrences does not necessarily mean that snow contributed significantly to the annual series of maximum 6- or 24-hr precipitation amounts. This problem was investigated by tabulating two sets of data for all stations where snowfall observations were made routinely. The first set of data contained the greatest 24-hr (and 6-hr amounts at recording-gage stations) precipitation amount for each year, regardless of type of precipitation (water equivalent for snowfall amounts). The second series was restricted solely to rainfall events. In some cases, the second series contained amounts as low as the fifth highest for a particular year. Results of these investigations are reported in the section for each state.

Reliability of Results

The term "reliability" is used here as an indication of the degree of confidence that can be placed in the accuracy of the results obtained from the maps. The reliability of these results is influenced by the sampling errors in time and space, and by the manner in which the maps were constructed. Sampling errors in time and space result from: (1) the chance occurrence of an anomalous storm which has a disproportionate effect on the statistics for one station, but not on those for a nearby station, and (2) the geographic distribution of stations. In the relatively nonorographic regions (shown shaded on fig. 8), the occurrence of large precipitation events can be considered to be relatively random over a limited geographic area. Thus, a large precipitation event (especially of convective nature) at a station could just as easily have occurred at a neighboring station or between stations. Results from a generalized analysis based on space-averaging techniques are considered more nearly correct than results determined from an analysis of only individual station data. In the more mountainous regions, orography has greater control on the location and magnitude of the largest storms and simple space averaging between neighboring stations is inappropriate; consideration must be given to effects of the slopes of surrounding terrain, station elevations, the intervening barrier between station location and moisture source, etc.

The locations of the stations used in the analyses are shown in figures 3 and 4. This geographic network of stations does not reveal with complete accuracy the very detailed structure of the isopluvial patterns in the mountainous regions of the West. The multiple regression equations discussed earlier were used to help in interpolation between values computed for these stations. The standard error of estimate for these relations should be considered when using the precipitation-frequency values shown on the maps. In general, the accuracy of the estimates obtained from the maps of this Atlas varies from a minimum of about 10 percent for the shorter return periods in relatively nonorographic regions to 20 percent for the longer return periods in the more rugged orographic regions.

The values shown on these maps are in general agreement with those of *Weather Bureau Technical Paper* No. 40 (U.S. Weather Bureau 1961). Differences are found because of the greater attention paid to physiographic features in the present study. Even though the precipitation-frequency maps presented are prepared considering physiographic factors, only those of a major scale could be considered. There are some basins, therefore, that are more sheltered or exposed than a generalized topographic map would indicate. The map values may not be representative of the precipitation regimes in such basins.

The major centers of large precipitation-frequency values are located on the most exposed and steepest slopes of the mountains. Objective studies (such as the regression analysis previously discussed) and experience in precipitation-frequency analysis have indicated some general guidelines for the placement of isopluvial centers along crests and on slopes of mountain ranges. Two examples will serve to illustrate such guidelines. For an initial completely exposed orographic barrier, where the crest of the range was 3,000 to 4,000 ft. above the plains region to the windward of the mountain and the slope was on the order of 300 ft per mile, the largest isopluvial line should extend past the crest and include a little of the lee side of the mountain. Where the crest of the range was 8,000 to 10,000 ft above the plains region to the windward of the mountain range and the slope was on the order of 1,000 ft per mile, the isopluvial center would generally be about 4,000 to 6,000 ft above the plains region. For mountain ranges with crests and slopes having other combinations of these values, the placement of the highest precipitation-frequency values would depend upon the degree of exposure of the mountain range to moisture-bearing wind, the steepness of the slope, the height of the crest, and other orographic factors. In general, isopluvial centers for the longer return periods tend to be located at lower elevations than the centers for the shorter return periods. The distance downslope that the center is displaced depends on the exposure and steepness of the slope. Centers will be displaced less on a steep slope than on a gentle slope similarly exposed.

Oregon

Discussion of Maps

Figures 19 through 30 present precipitation-frequency maps for Oregon for 6- and 24-hr durations for return periods of 2, 5, 10, 25, 50, and 100 yrs. The isopluvial maps represent the 360- and 1,440-min durations for the partial-duration series. Data were tabulated for clock and observation-day intervals for the annual series and were adjusted by the empirical factors given in the ANALYSIS section.

Isoline interval. The isoline intervals selected were designed to provide a reasonably complete description of the isopluvial pattern in various regions of the state. For that portion of Oregon that extends from the eastern foothills of the Cascade Range westward to the coast, the isoline interval for the 24-hr duration is 0.5 in. for precipitation-frequency values below 8.0 in., with an interval of 1.0 in. above that value at the 2- and 5-yr return period. For the 10- through 100-yr return period, the 7-0-in. precipitation-frequency value separates the 0.5-in. and 1.0-in. intervals. At the 6-hr duration, the isoline interval in this part of the State is 0.1 in. below a precipitation-frequency value of 1.4 in. and 0.2 in. from 1.4 to 3.0 in. Above 3.0 in., the interval is 0.4 in. for 2- through 25-yr return periods and 0.5 in. for return periods of 50 and 100 yrs. For that portion of the state east of the eastern foothills of the Cascade Range, the isoline interval on the 24-hr precipitation-frequency maps is 0.2 in. for values up to 3.0 in. and 0.4 in. for values over 3.0 in. On the maps for the 6-hr duration, the interval is 0.1 in. for values to 1.6 in. on the 2- to 25-yr return periods and to 1.4 in. at the 50- and 100-yr return periods. From 1.6 in. (or 1.4 in. for the 50- and 100-yr maps) to 3.0 in., the isoline interval is 0.2 in. and above 3.0 in. the interval is 0.4 in. Dashed intermediate lines have been placed between widely separated isolines and in regions where a linear interpolation between the normal isopluvial interval would lead to erroneous interpolation. "Lows" that close within the boundaries of a particular map have been hatched on the low-valued side of the isoline.

Importance of snow in precipitation-frequency values. The maps in this Atlas represent frequency values of precipitation regardless of type. For many hydrologic purposes, precipitation falling as rain must be treated in a different manner from that falling as snow. The contribution of snow amounts to precipitation-frequency values in Oregon and the Pacific Northwest (roughly Idaho, Oregon, Washington, and small adjacent portions of California and Nevada) was investigated. In this area, there were 179 stations having 10 to 15 yrs of observations of snowfall as part of the precipitation observing program. Sixty-two of these stations are in Oregon. Table 11 shows the distribution of these stations by regions considered to be more meteorologically realistic than are state boundaries. For each of the 179 stations (56 of which were equipped with recording precipitation gages), two data series were formed as discussed under Interpretation of Results, Importance of Snow in Estimating Frequency Values.

A ratio was formed of the 2-yr 24-hr value for the series containing maximum annual events without regard to type of precipitation and the 2-yr 24-hr value for the series with snow occurrences eliminated. At more than 75 percent of the stations in the Pacific Northwest, this ratio showed differences between the two series to be 10 percent or less. A similar ratio for the 25-yr return period showed a difference as great as 10 percent at only about 5 percent of the stations. Further analysis was made for stations having ratios that showed the greatest difference between the two series.

Data from stations in the coastal plains region of Washington and Oregon (Region 31, fig. 9) showed that the maximum annual 24-hr event can contain snow, but such a case occurs only about 5 percent of the time. Less than half the stations within this region had any maximum annual event that included snow, and ratios for all durations and stations showed less than 10 percent difference between the two data series. Thus, snow was not considered to be of importance to precipitation-frequency values in this region.

Most of the mountainous portions of Oregon are included within Regions 13 and 14 of figure 9. In these regions, it is not unusual for the maximum annual event to include some snow or even to be composed of all or mostly snow. However, the areas where such events cause major differences between the series of all precipitation data regardless of type and the series composed exclusively of rain are relatively limited in extent. These areas are at the higher elevations of the Cascades and immediately to the lee of the crest of the Cascades. In this area of Washington and Oregon, data are available from about 20 stations ranging in elevation from 2,000 ft to over 6,500 ft. These data indicate that the 2-yr 24-hr values for a series containing only rain events would be 10 to 20 percent lower than the values presented on the precipitation-frequency maps in this Atlas at elevations of 2,000 to 4,000 ft, and the differences would range upward to 30 and possibly as much as 50 percent lower above 5,000 ft. The area to the lee of the crest of the Cascades would be limited to somewhat less than 50 mi in width; and in this narrow band, the rain-only series would be from 20 to as much as 35 percent less than the values presented on the 2-yr 24-hr map for Oregon.

Data from stations in the nonorographic regions east of the Cascades (Region 32, fig. 9) show snow to be of minor importance in the precipitation-frequency regime. Less than one maximum annual value out of every five will contain any snow, and 80 percent of the stations available for analysis showed differences of less than 10 percent in the two series of data tabulated.

The remainder of Oregon is included within Region 12, figure 9. Most of this region lies in Idaho. Analysis of the data for this region leads to the conclusion that snow is not an important factor in the precipitation-frequency regime. Ratios between 2-yr 24-hr values from the two series of data that were tabulated showed differences between the two series to be mostly small. It was found that maximum annual values that contained snow were most likely to be found in the lower two-thirds of the ranked data sample. This is discussed in more detail in NOAA Atlas 2, "Precipitation-Frequency Atlas of Western United States, Volume V—Idaho" (National Oceanic and Atmospheric Administration 1973).

The data analysis of the two series showed that the curves converge with increasing return period. At the 25-yr return period, only about 5 percent of the 179 stations showed differences greater than 10 percent between the two series. These stations were not concentrated in any region and did not show a geographic pattern. Generally, such differences result when one or a few of the larger values in the data series composed of all maximum annual events contains some snow, while the rain-only amount for that year is small and becomes a much lower ranked value in the exclusively rain series.

At the 6-hr duration, the data are restricted to stations with recording gages (12 recording precipitation-gage stations in Oregon). An analysis similar to that for the 24-hr duration showed that the ratio of the maximum annual series and the series without snow was lower at the 6-hr duration than at the 24-hr duration. This is meteorologically realistic since the portion of a 24-hr storm that contains snow is most likely to be of less intensity than is the maximum 6-hr period of that storm.

The conclusion was made that, except as previously noted, the elimination of amounts containing snow does not materially change the precipitation-frequency values on maps for Oregon. For the 24-hr duration where there are differences between results computed from the two series at the 2-yr return period, the differences would decrease to no more than half as large at the 25-yr recurrence interval and be negligible at the 100-yr recurrence interval.

In the selection of data for the series made up of amounts containing rain only, an observation was eliminated no matter how much snow was reported. Thus, an eliminated amount could have contained only a small portion of the precipitation as snow or it could have been all snow. In some cases, the amount of rain in a storm with little snow could have been greater than the value actually selected for that year since only a few stations report water content of snow (which would have enabled the tabulator to segregate such cases). Thus, the data could yield rain-only values actually less than the true amount but could not give results greater than the true amount. Therefore, the ratios compared tended to show maximum differences.

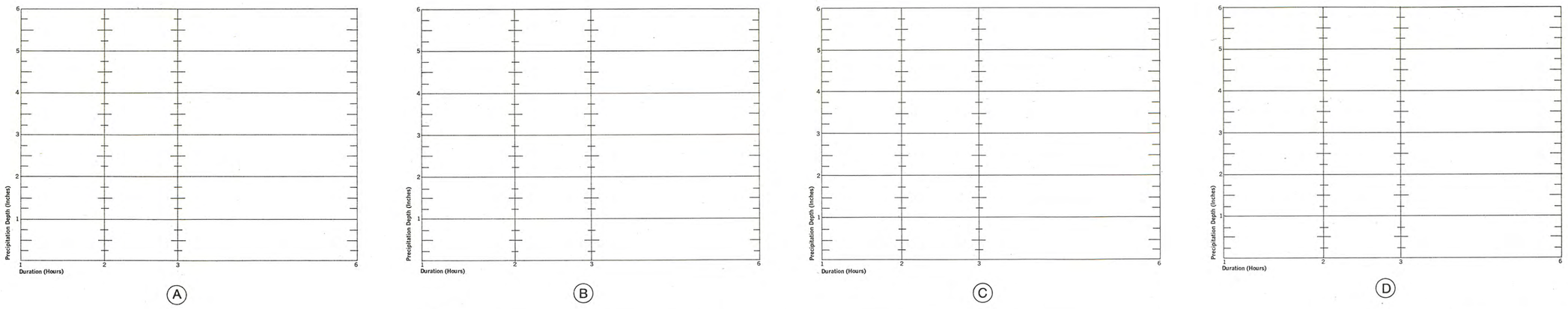


Figure 15. *Precipitation depth-duration diagram (1- to 6-hr).*
a. Mountainous regions of Washington and Oregon east of crest of Cascade Range and of Idaho and Montana west of Continental Divide and north of southern boundary of Snake River Basin (Region 1, fig. 18).
b. Nonorographic region east of crest of Cascade Range (Region 2, fig. 18).
c. Coastal plains, Puget Sound region, and Willamette Valley below 1,000 ft (Region 3, fig. 18). Olympic Mountains, western slopes of Cascade and Coast Ranges (Region 4 fig. 18).
d. Southeastern Oregon drained by the Quinn River (Region 5, fig. 18).

Procedures for Estimating Values for Durations Other Than 6 and 24 Hrs

The isopluvial maps in this Atlas are for 6- and 24-hr durations. For many hydrologic purposes, values for other durations are necessary. Such values can be estimated using the 6- and 24-hr maps and the empirical methods outlined in the following sections. The procedures detailed below for obtaining 1-, 2-, and 3-hr estimates were developed specifically for this Atlas. The procedures for obtaining estimates for less than 1-hr duration and for 12-hr duration were adopted from *Weather Bureau Technical Paper* No. 40 (U.S. Weather Bureau 1961) only after investigation demonstrated their applicability to data from the area covered by this Atlas.

Procedures for estimating 1-hr (60-min) precipitation-frequency values. Multiple-regression screening techniques were used to develop equations for estimating 1-hr values. Factors considered in the screening process were restricted to those that could be determined easily from the maps of this Atlas or from generally available topographic maps.

The 11 western states were separated into several geographic regions. The regions were chosen on the basis of meteorological and climatological homogeneity and are generally combinations of river basins separated by prominent divides. Five of these geographic regions are partially within Oregon. For convenience and use as an overlay on the precipitation-frequency maps, the regions are outlined on figure 18. The first region includes the mountainous sections of eastern Oregon east of the crest of the Cascades (Region 1, fig. 18). This is part of a larger region that includes all the mountainous sections from the crest of the Cascades eastward to the Continental Divide and north of the southern boundary of the Snake River Basin. Region 2, figure 18, is the essentially nonorographic portions of eastern Oregon. There are three such nonorographic regions between the crest of the Cascades and the Continental Divide found to have similar relations between data for 1-, 6-, and 24-hr durations. One of these is completely within Oregon, whereas the other two extend partially into Oregon from Washington and Idaho. The coastal lowlands and nonorographic sections of western Washington and Oregon below 1,000-ft elevation make up another region (Region 3, fig. 18). This includes the Willamette Valley below 1,000 ft. The fourth region consists of the western slopes of the Cascade and the Coast Ranges of Oregon (Region 4, fig. 18). This region extends into Washington, where it also includes the Olympic Mountains. Region 5, figure 18, in southeastern Oregon is a small portion of a region that extends from central Utah through Nevada and into the desert regions of California. In Oregon, this is the area drained by the Quinn River. Equations to provide estimates for the 1-hr duration for the 2- and 100-yr return periods are shown in table 12. Also listed are the statistical parameters associated with each equation. The variable $[(X_1)(X_1/X_2)]$ or $[X_3)(X_3/X_4)]$ can be regarded as the 6-hr value times the slope of a line connecting the 6- and 24-hr values for the appropriate return period. The variable Y_2 appears in the right side of the 100-yr 1-hr equations for Regions 3 and 4. If the 2-yr 1-hr value is not required, the equation for Y_2 can be substituted and the second equation for Y_{100} shown in table 12 can be used.

Table 11. *Percent of snowfall stations in Pacific Northwest by regions*

Number of region in figure 9	Region	Percent of stations
12	Mountainous region of Idaho west of Bitterroot Range crest and Continental Divide and north of southern boundary of Snake River Basin—excluding Snake River Valley below a generalized 5,000-ft contour	30
13	Orographic region east of crest of Cascade Range and west of Snake River Basin	20
14	Olympic Mountains and western slopes of Coast and Cascade Ranges	14
30	Snake River Valley below 5,000 ft	13
31	Coastal Plain, Puget Sound region, and Willamette Valley below 1,000 ft	12
32	Nonorographic region east of crest of Cascade Range	11

As with any separation into regions, the boundary can only be regarded as the sharpest portion of a zone of transition between regions. These equations have been tested for boundary discontinuities by computing values using equations from both sides of the boundary. Differences were found to be mostly under 15 percent. However, it is suggested that when computing estimates along or within a few miles of a regional boundary computations be made using equations applicable to each region and that the average of such computations be adopted.

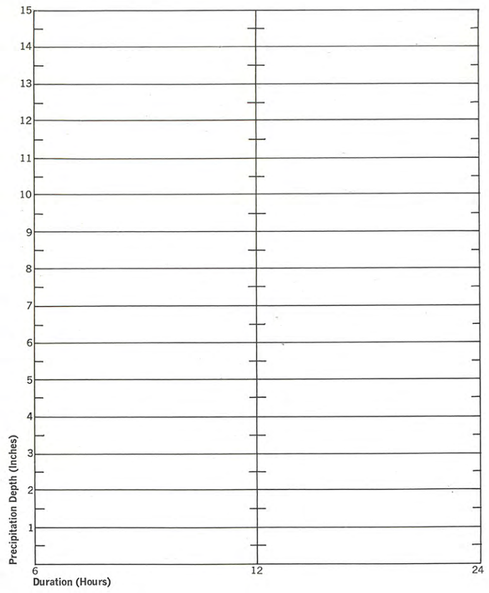


Figure 16. *Precipitation depth-duration diagram (6- to 24-hr).*

Estimates of 1-hr precipitation-frequency values for return periods between 2 and 100 yrs. The 1-hr values for the 2- and 100-yr return periods can be plotted on the nomogram of figure 6 to obtain values for return periods greater than 2 yrs or less than 100 yrs. Draw a straight line connecting the 2- and 100-yr values and read the desired return-period value from the nomogram.

Estimates for 2- and 3-hr (120- and 180-min) precipitation-frequency values. To obtain estimates of precipitation-frequency values for 2 or 3 hrs, plot the 1- and 6-hr values from the Atlas on the appropriate nomogram of figure 15. Draw a straight line connecting the 1- and 6-hr values, and read the 2- and 3-hr values from the nomogram. This nomogram is independent of return period. It was developed using data from the same regions used to develop the 1-hr equations.

The mathematical solution from the data used to develop figure 15 gives the following equations for estimating the 2- and 3-hr values:

For Region 1, figure 18	2-hr = 0.250 (6-hr) + 0.750 (1-hr)	(3)
	3-hr = 0.467 (6-hr) + 0.533 (1-hr)	(4)
For Region 2, figure 18	2-hr = 0.278 (6-hr) + 0.722 (1-hr)	(5)
	3-hr = 0.503 (6-hr) + 0.497 (1-hr)	(6)
For Regions 3 and 4, figure 18	2-hr = 0.240 (6-hr) + 0.760 (1-hr)	(7)
	3-hr = 0.468 (6-hr) + 0.532 (1-hr)	(8)
For Region 5, figure 18	2-hr = 0.299 (6-hr) + 0.701 (1-hr)	(9)
	3-hr = 0.526 (6-hr) + 0.476 (1-hr)	(10)

Estimates for 12-hr (720-min) precipitation-frequency values. To obtain estimates for the 12-hr duration, plot values from the 6- and 24-hr maps on figure 16. Read the 12-hr estimates at the intersection of the line connecting these points with the 12-hr duration line of the nomogram.

Estimates for less than 1 hr. To obtain estimates for durations of less than 1 hr, apply the values in table 13 to the 1-hr value for the return period of interest.

Illustration of Use of Precipitation-Frequency Maps, Diagrams, and Equations

To illustrate the use of these maps, values were read from figures 19 to 30 for the point at 44°00′ N. and 118°00′ W. These values are shown in boldface type in table 14. The values read from the maps should be plotted on the return-period diagram of figure 6 because (1) not all points are as easy to locate on a series of maps as are latitude-longitude intersections, (2) there may be some slight registration differences in printing, and (3) precise interpolation between isolines is difficult. This has been done for the 24-hr values in table 14 (fig. 17a) and a line of best fit has been drawn subjectively. On this nomogram, the 2- and 25-yr values appear to be somewhat off the line. The value read from the maps is corrected (as shown by the strikeout in table 14); such corrected values are adopted in preference to the original readings.

The 2- and 100-yr 1-hr values for the point were computed from the equations applicable to Region 2, figure 18 (table 12) since the point is in the nonorographic region. The 2-yr 1-hr is estimated at 0.37 in. (latitude of 44° and longitude of 118° and the 2-yr 6- and 24-hr values from table 14); the estimated 100-yr 1-hr value is 1.07 in. (100-yr 6- and 24-hr values from table 14). By plotting these 1-hr values on figure 6 and connecting them with a straight line, one can obtain estimates for return periods of 5, 10, 25, and 50 yrs.

The 2- and 3-hr values can be estimated by using the proper nomogram of figure 15 or equations (5) and (6). The 1- and 6-hr values for the desired return period are obtained as above. Plot these points on the nomogram in figure 15 and connect them with a straight line. Read the estimates for 2 or 3 hrs at the intersections of the connecting line and the 2- and 3-hr vertical lines. An example is shown in figure 17b for the 2-yr return period. The 2-yr 2-hr (0.50 in.) and 2-yr 3-hr (0.55 in.) values are in italics in table 14 and compare closely with the values of 0.47 and 0.57, which would result from application of equations (5) and (6).

Table 12. *Equations for estimating 1-hr values in Oregon with statistical parameters for each equation*

Region of applicability*	Equation	Corr. coeff.	No. of stations	Mean of computed stn. values (inches)	Standard error of estimate (inches)
Mountainous regions of Washington and Oregon east of crest of Cascade Range and of Idaho and Montana west of Continental Divide and north of southern boundary of Snake River Basin (1)	$Y_2 = 0.019 + 0.711[(X_1)(X_1/X_2)] + 0.001Z$	0.82	98	0.40	0.031
	$Y_{100} = 0.338 + 0.670[(X_3)(X_3/X_4)] + 0.001Z$	.80	79	1.04	.141
Nonorographic region east of crest of Cascade Range (2)	$Y_2 = 0.077 + 0.715[(X_1)(X_2/X_3)] - 0.0004(X_5)(X_6)$	.86	30	0.35	.034
	$Y_{100} = 0.187 + 0.833[(X_3)(X_3/X_4)]$	.87	30	1.08	.161
Coastal plains, Puget Sound region, and Willamette Valley below 1,000 ft (3)	$Y_2 = 0.157 + 0.513[(X_1)(X_1/X_2)]$	.89	61	0.52	.050
	$Y_{100} = 0.324 + 0.752[(Y_2)(X_3/X_1)]$	.82	61	1.01	.113
	$Y_{100} = 0.324 + 0.118(X_3/X_1) + 0.386[(X_1)(X_3/X_2)]$				
Olympic Mountains, western slopes of Cascade and Coast Ranges (4)	$Y_2 = 0.160 + 0.520[(X_1)(X_1/X_2)]$	.86	70	0.54	.054
	$Y_{100} = 0.177 + 0.965[(Y_2)(X_3/X_1)]$	.74	66	1.10	.171
	$Y_{100} = 0.177 + 0.154(X_3/X_1) + 0.502[(X_1)(X_3/X_2)]$				
Southeastern Oregon drained by the Quinn River (5)	$Y_2 = 0.005 + 0.852[(X_1)(X_1/X_2)]$	.89	65	0.41	.047
	$Y_{100} = 0.322 + 0.789[(X_3)(X_3/X_4)]$	.87	65	1.25	.196

* Numbers in parentheses refer to geographic regions shown in figure 18. See text for more complete description.

List of variables
Y_2 = 2-yr 1-hr estimated value
Y_{100} = 100-yr 1-hr estimated value
X_1 = 2-yr 6-hr value from precipitation-frequency maps
X_2 = 2-yr 24-hr value from precipitation-frequency maps
X_3 = 100-yr 6-hr value from precipitation-frequency maps
X_4 = 100-yr 24-hr value from precipitation-frequency maps
X_5 = latitude (in decimals) minus 40°
X_6 = longitude (in decimals) minus 100°
Z = point elevation in hundreds of feet

Table 13. *Adjustment factors to obtain n-min estimates from 1-hr values*

Duration (min)	5	10	15	30
Ratio to 1-hr	0.29	0.45	0.57	0.79

(Adopted from *U.S. Weather Bureau Technical Paper* No. 40, 1961.)

Figure 17. *Illustration of use of precipitation-frequency diagrams using values from precipitation-frequency maps and relations.*

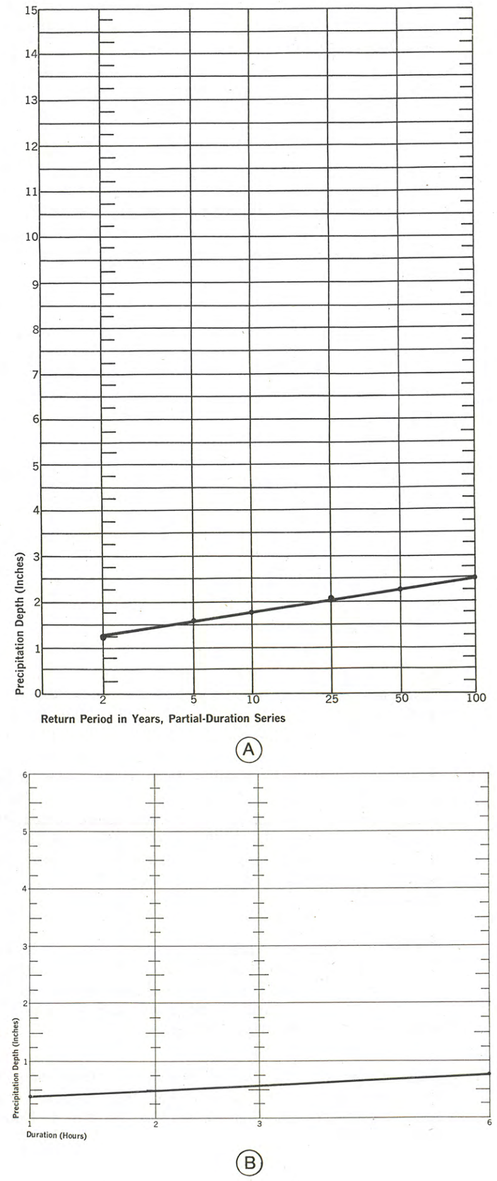


Table 14. *Precipitation data for depth-frequency atlas computation point 44°00′ N., 118°00′ W.*

	1-hr	2-hr	3-hr	6-hr	24-hr
					1.26
2-yr	*0.37*	*0.47*	*0.57*	0.74	~~1.23~~
5-yr				0.95	1.56
10-yr				1.12	1.75
					2.02
25-yr				1.34	~~2.05~~
50-yr				1.49	2.25
100-yr	*1.07*			1.63	2.50

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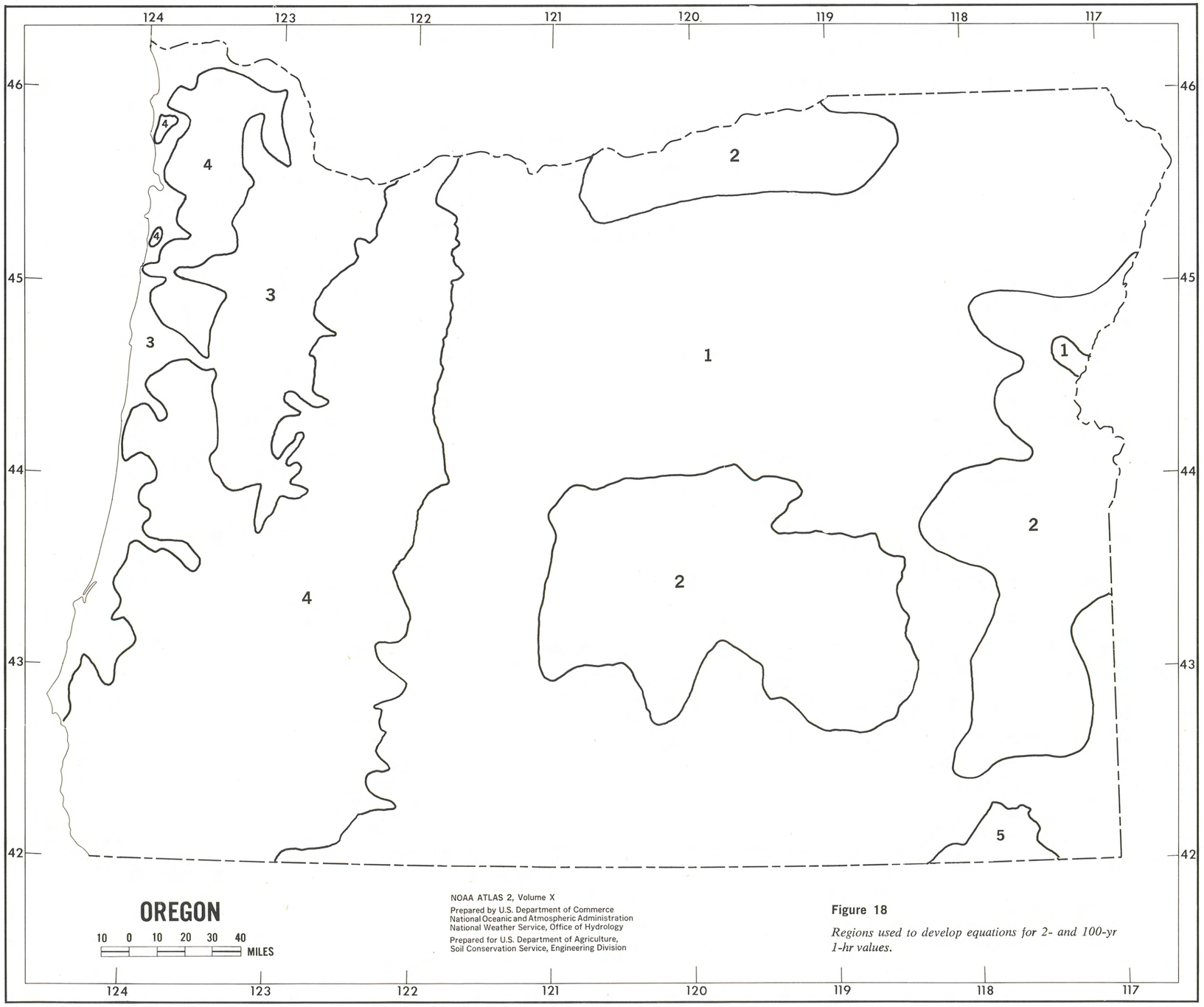

Figure 18

Regions used to develop equations for 2- and 100-yr 1-hr values.

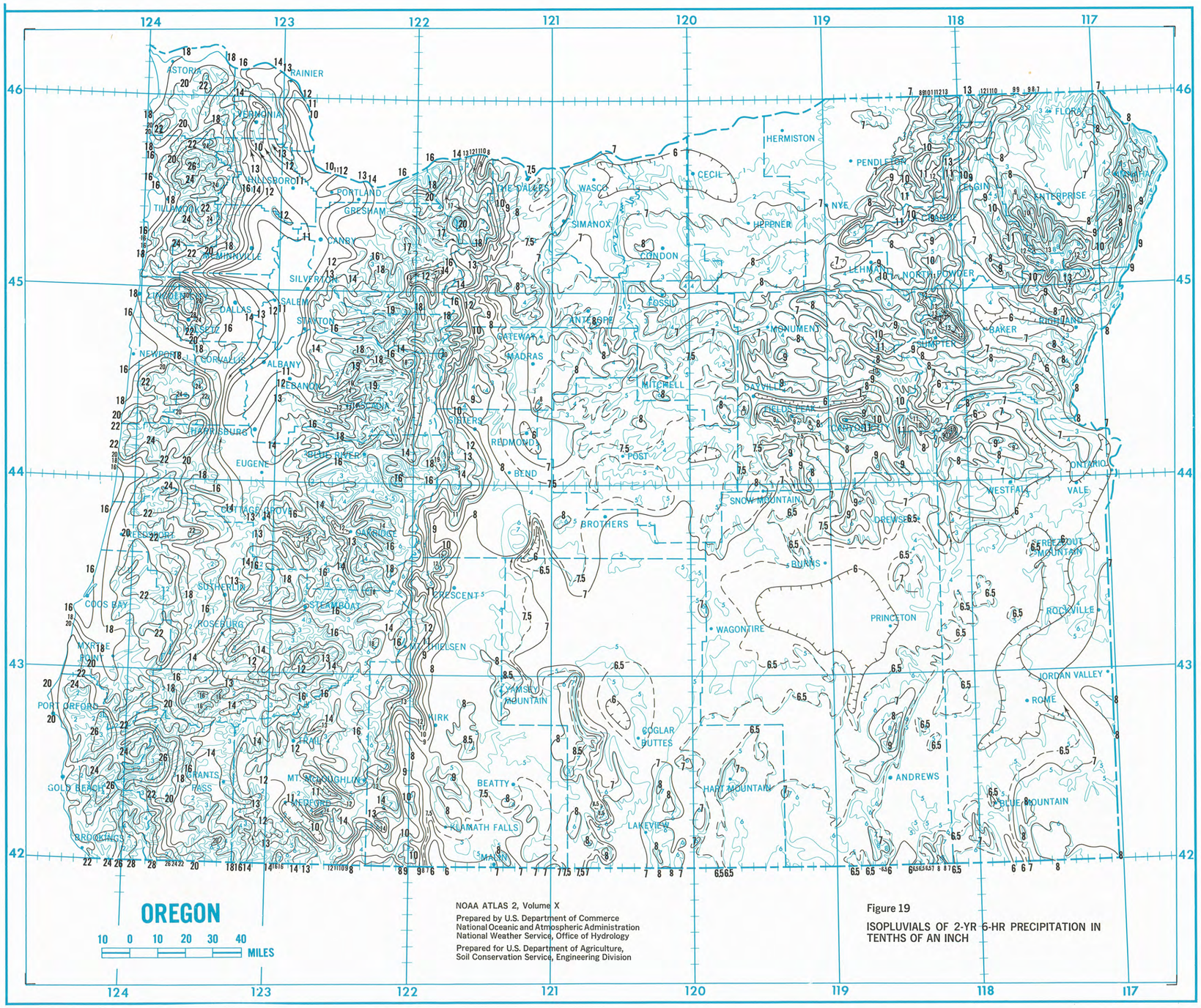

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Figure 19

ISOPLUVIALS OF 2-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

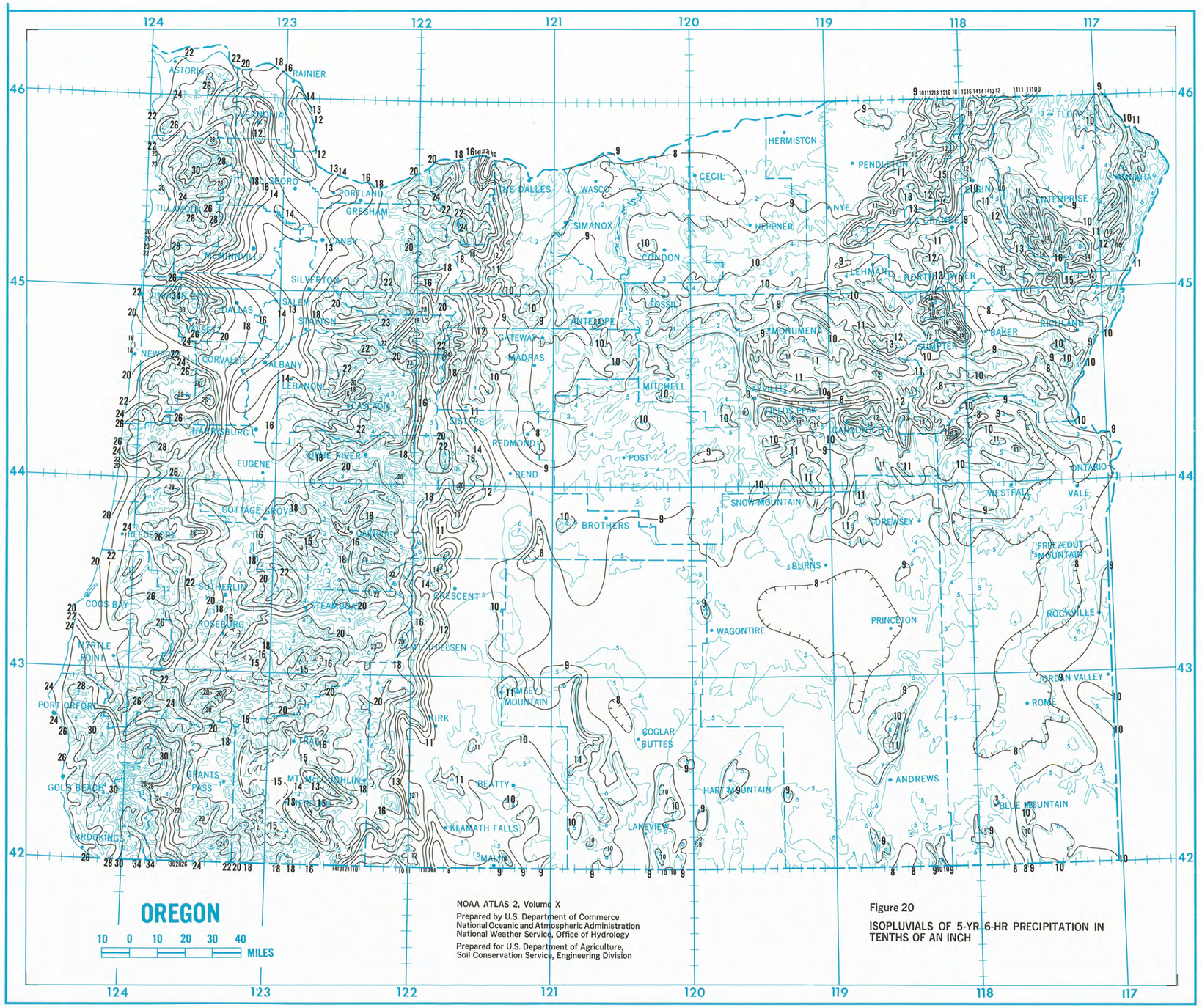

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Figure 20

ISOPLUVIALS OF 5-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

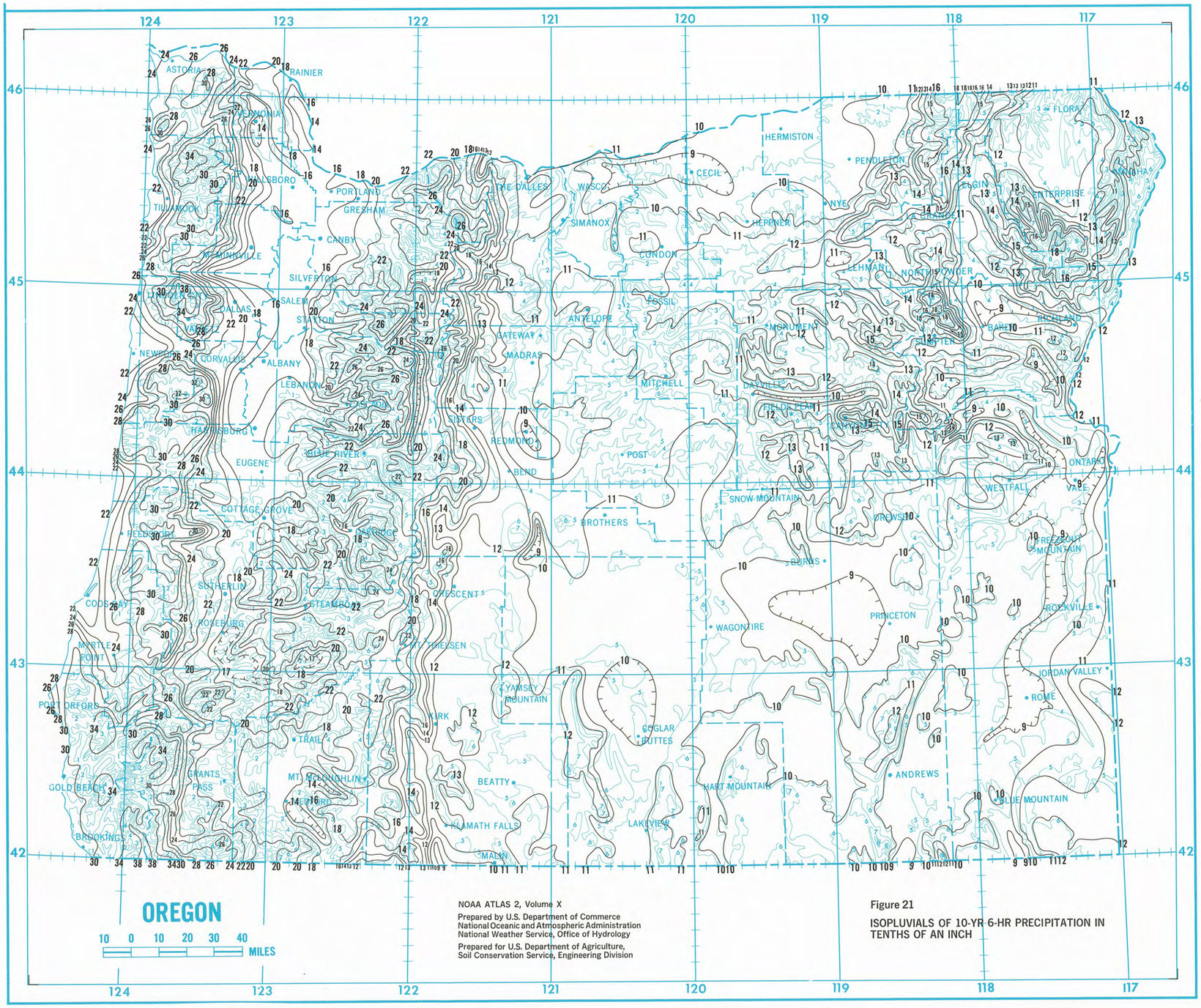

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Figure 21

ISOPLUVIALS OF 10-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

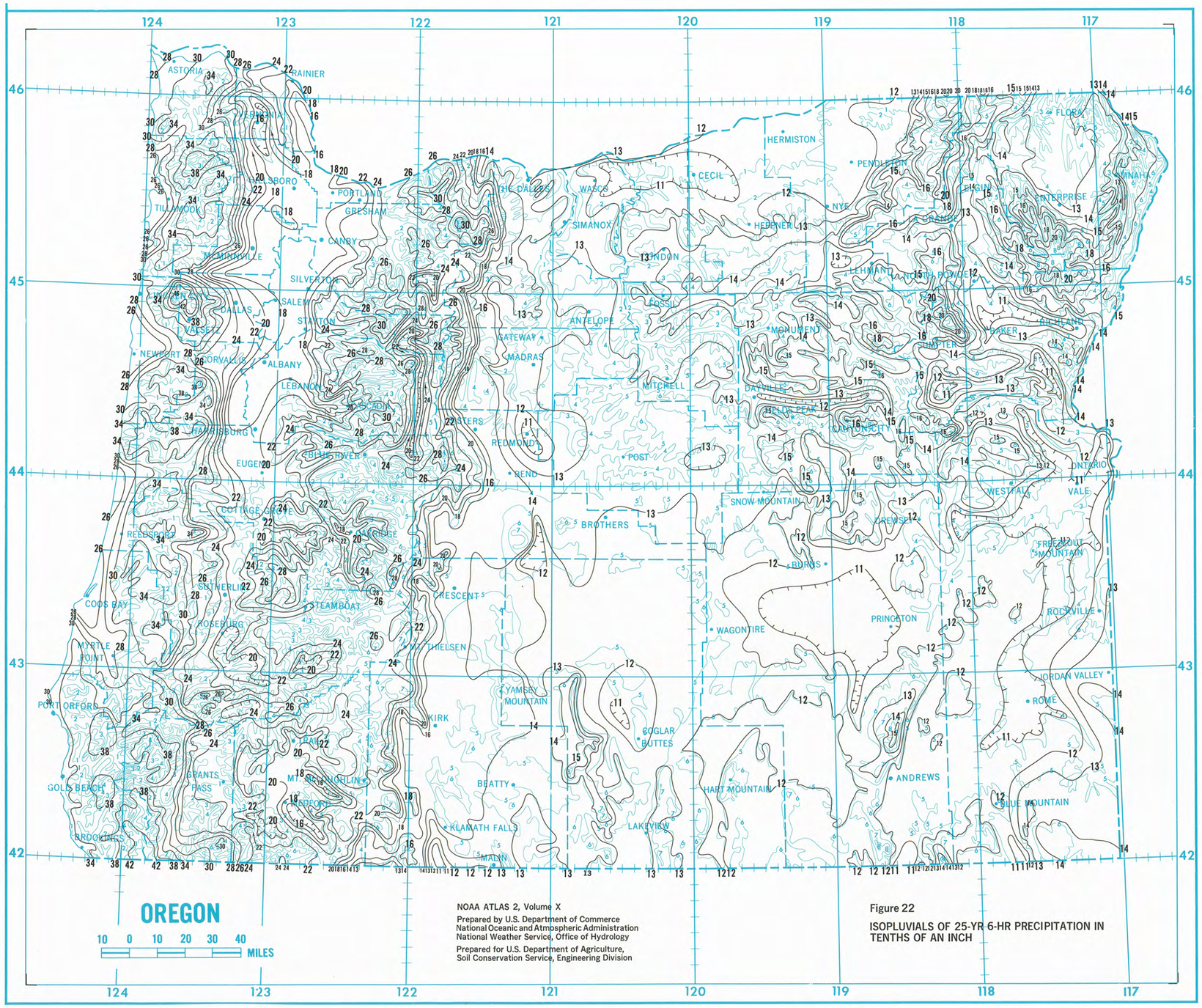

Figure 22

ISOPLUVIALS OF 25-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

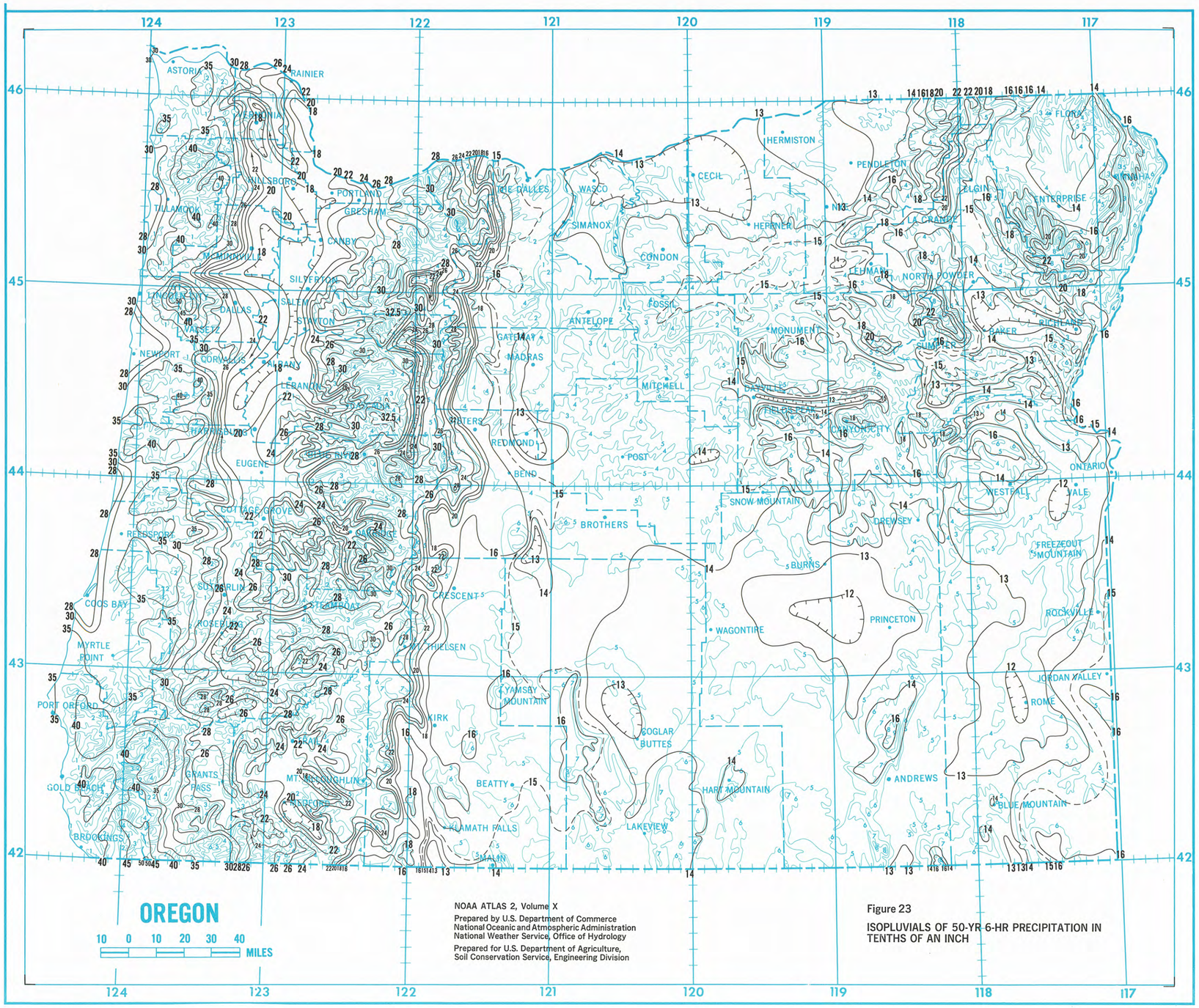

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Figure 23

ISOPLUVIALS OF 50-YR 6-HR PRECIPITATION IN TENTHS OF AN INCH

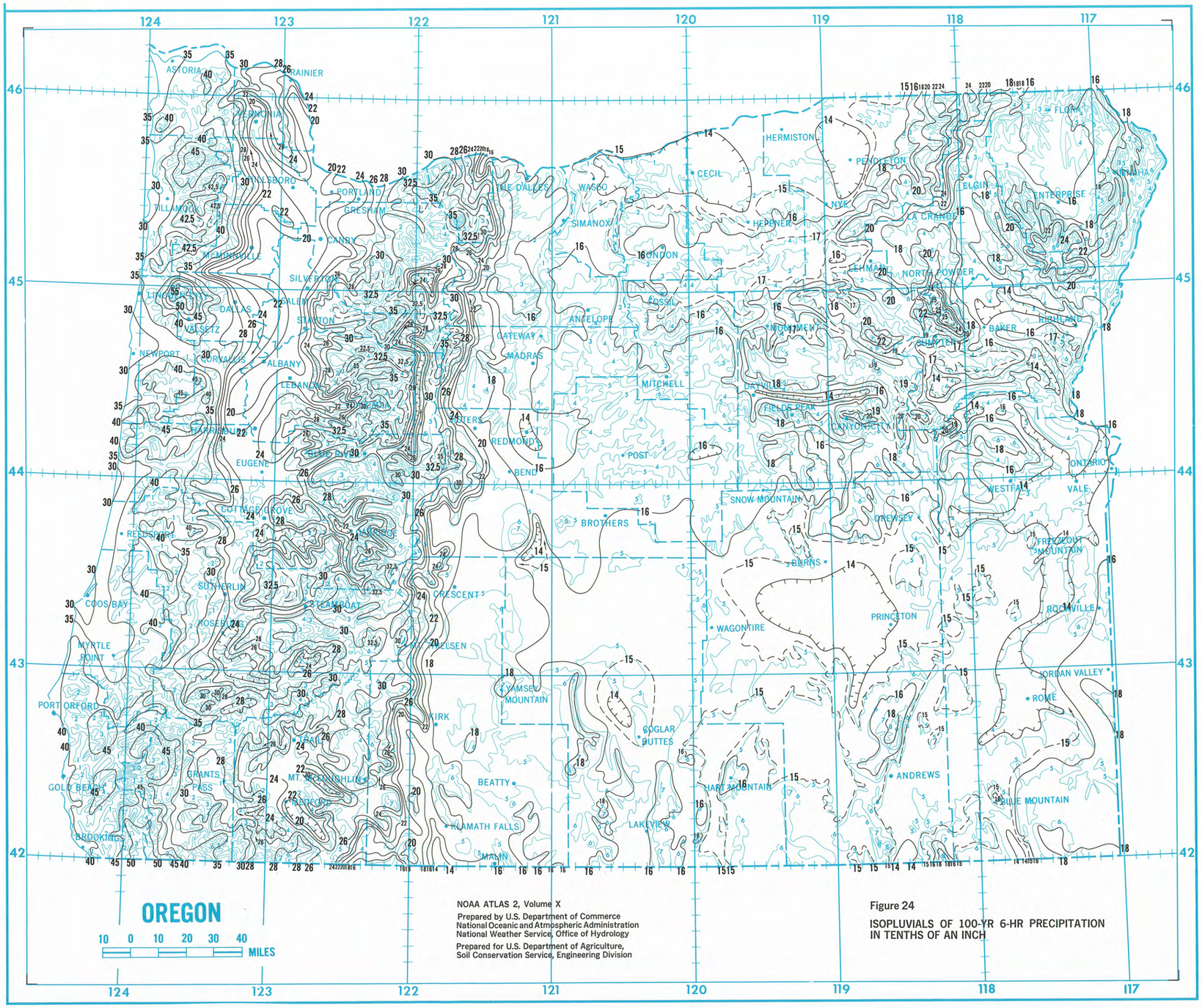

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Figure 24

ISOPLUVIALS OF 100-YR 6-HR PRECIPITATION
IN TENTHS OF AN INCH

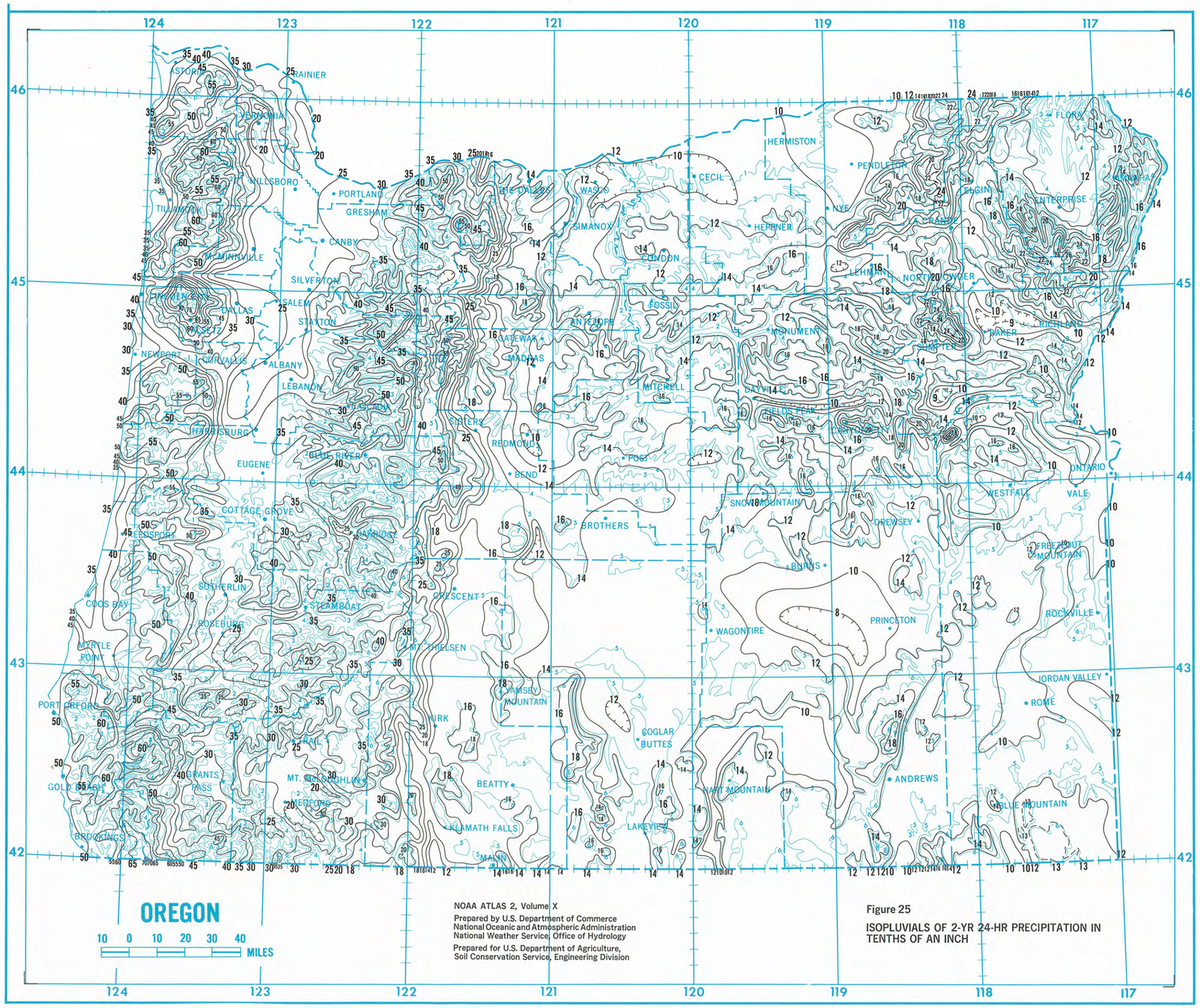

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Figure 25

ISOPLUVIALS OF 2-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

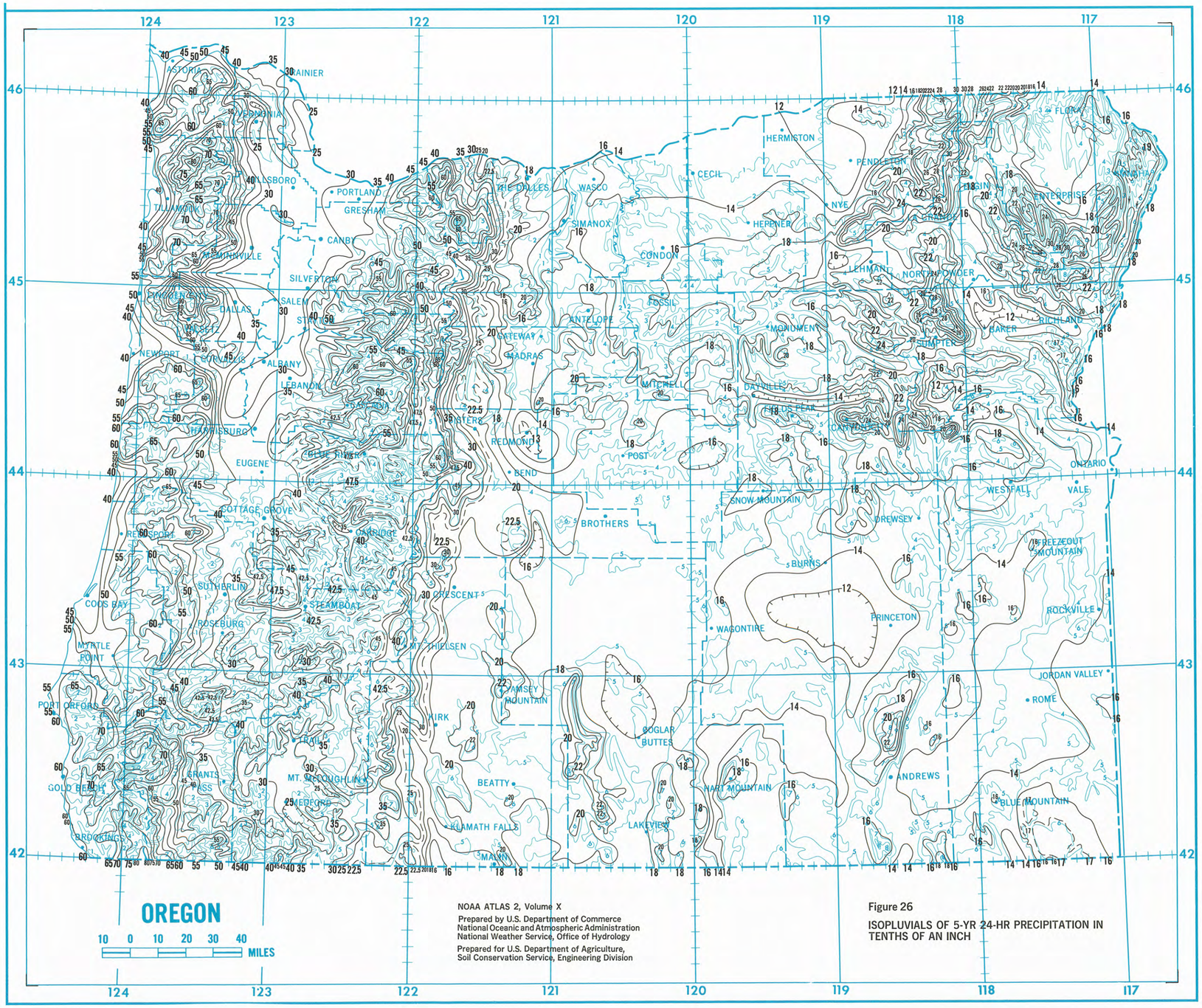

Figure 26

ISOPLUVIALS OF 5-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

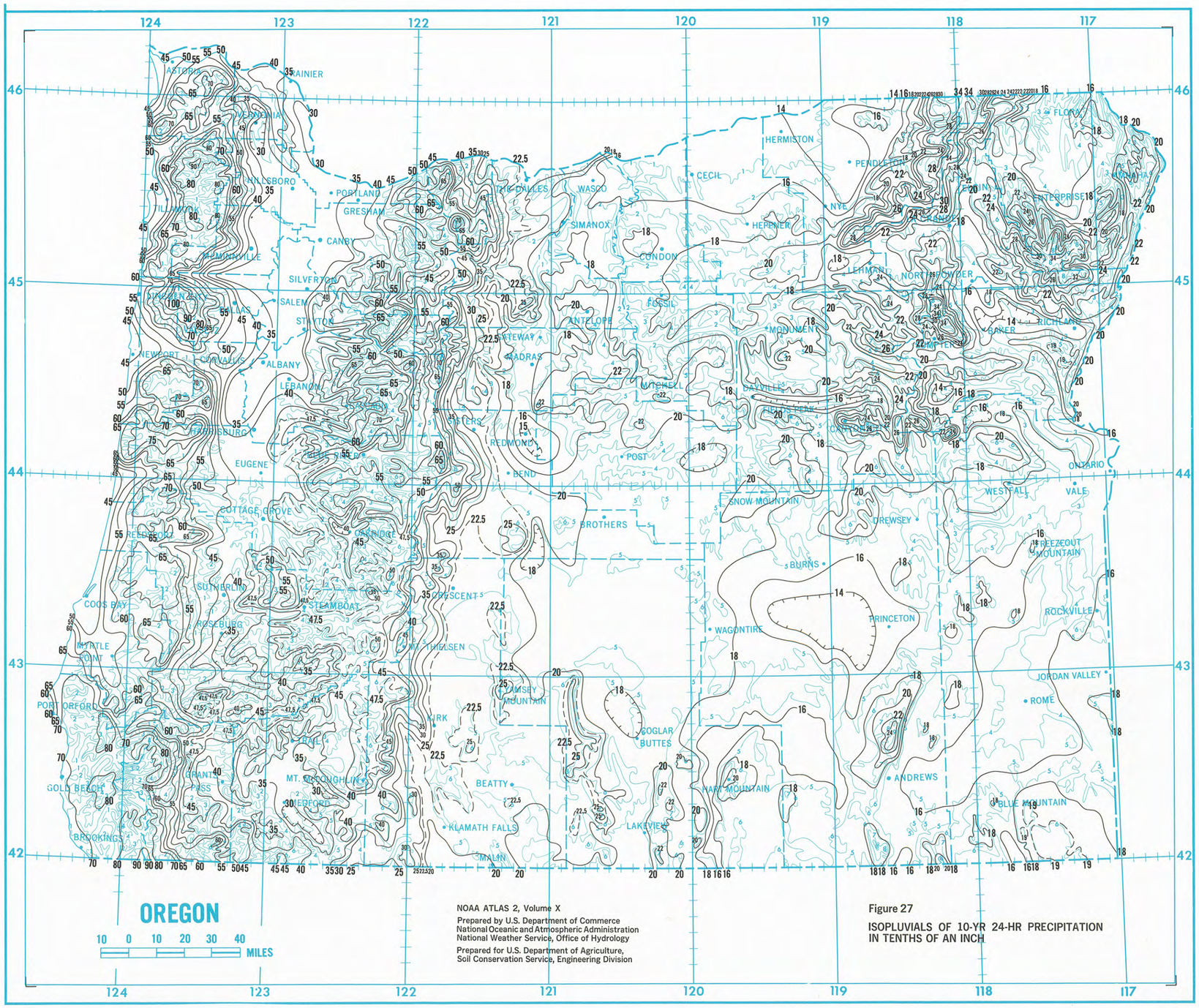

Figure 27

ISOPLUVIALS OF 10-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

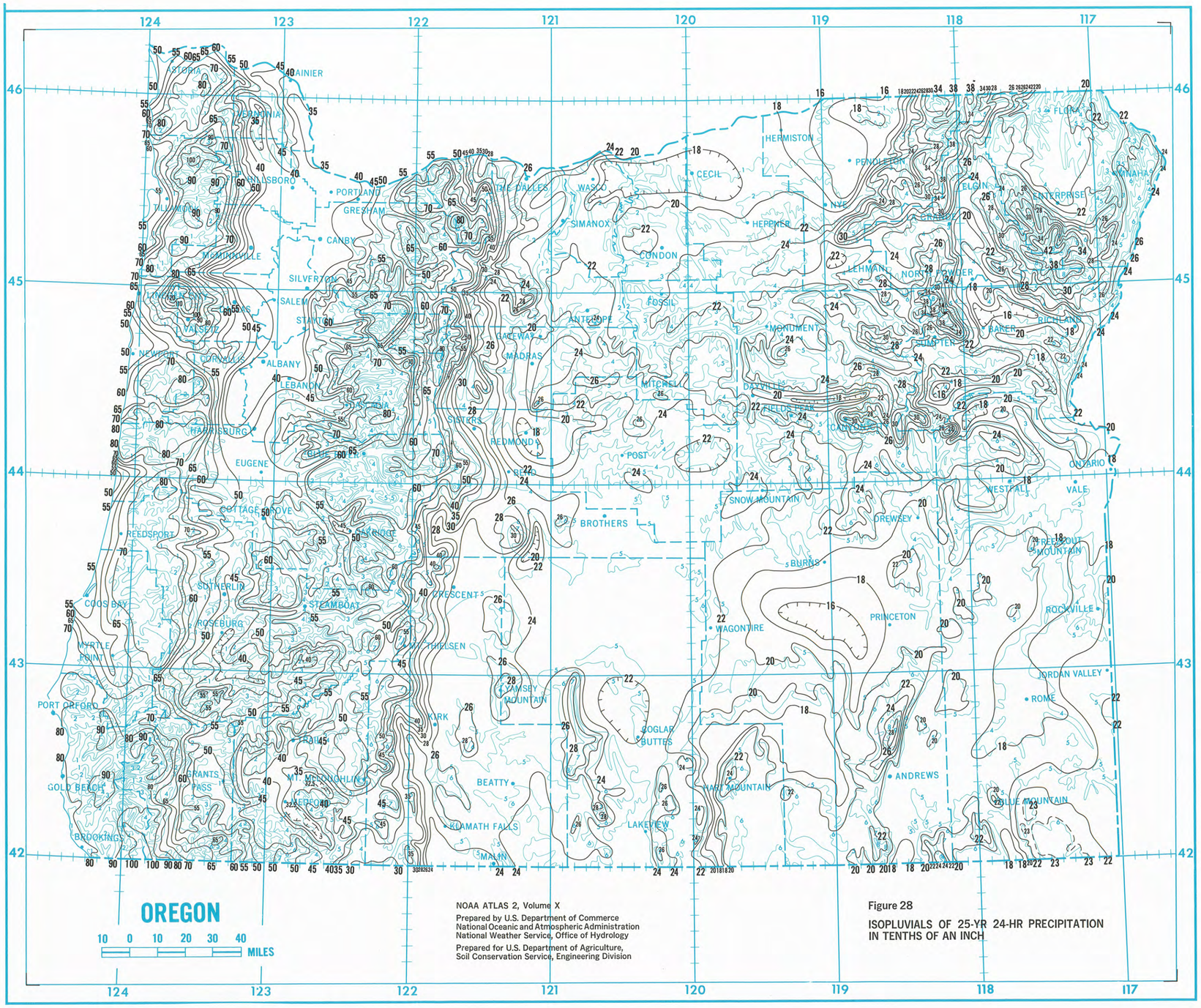

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Figure 28

ISOPLUVIALS OF 25-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

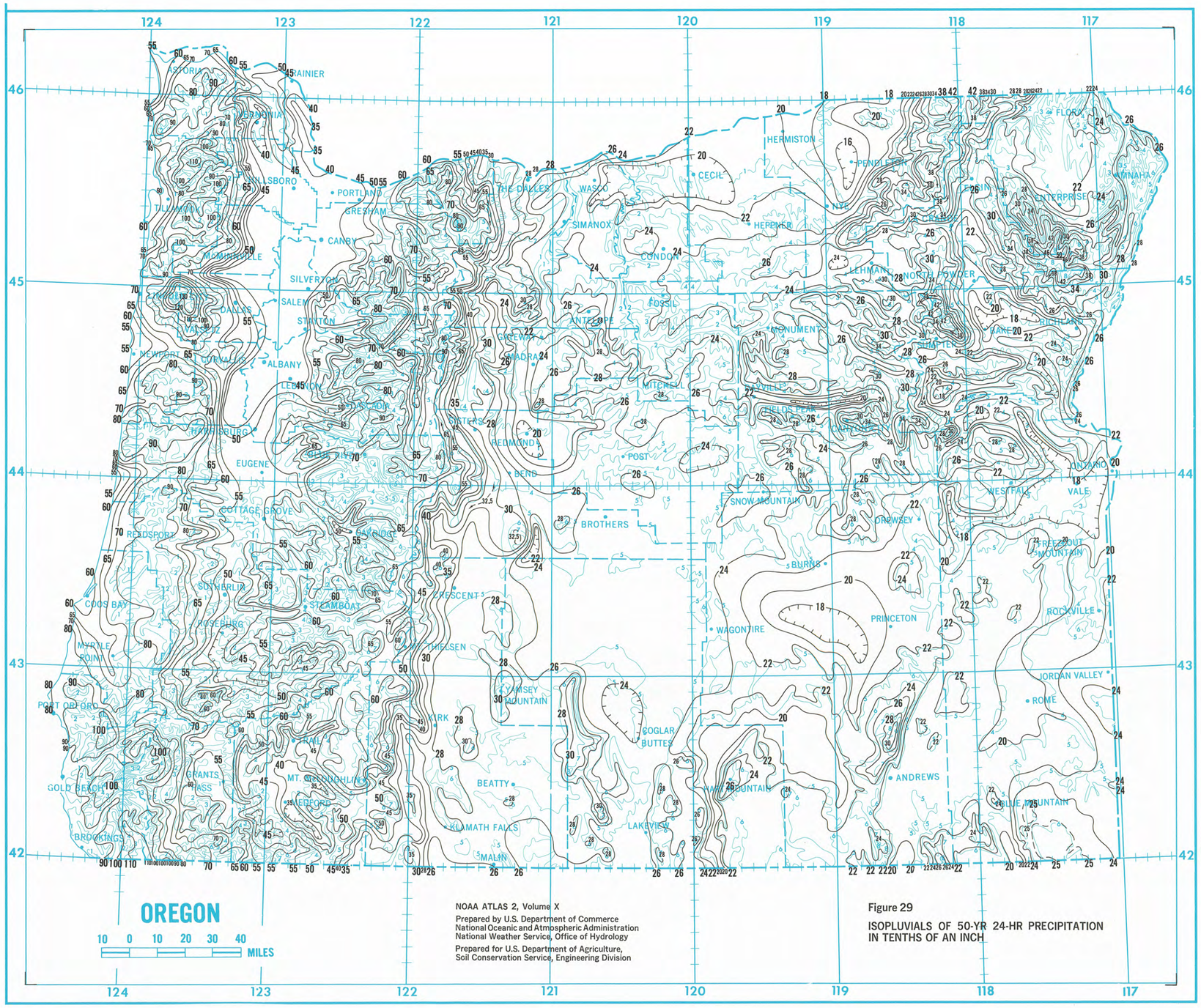

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Figure 29

ISOPLUVIALS OF 50-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

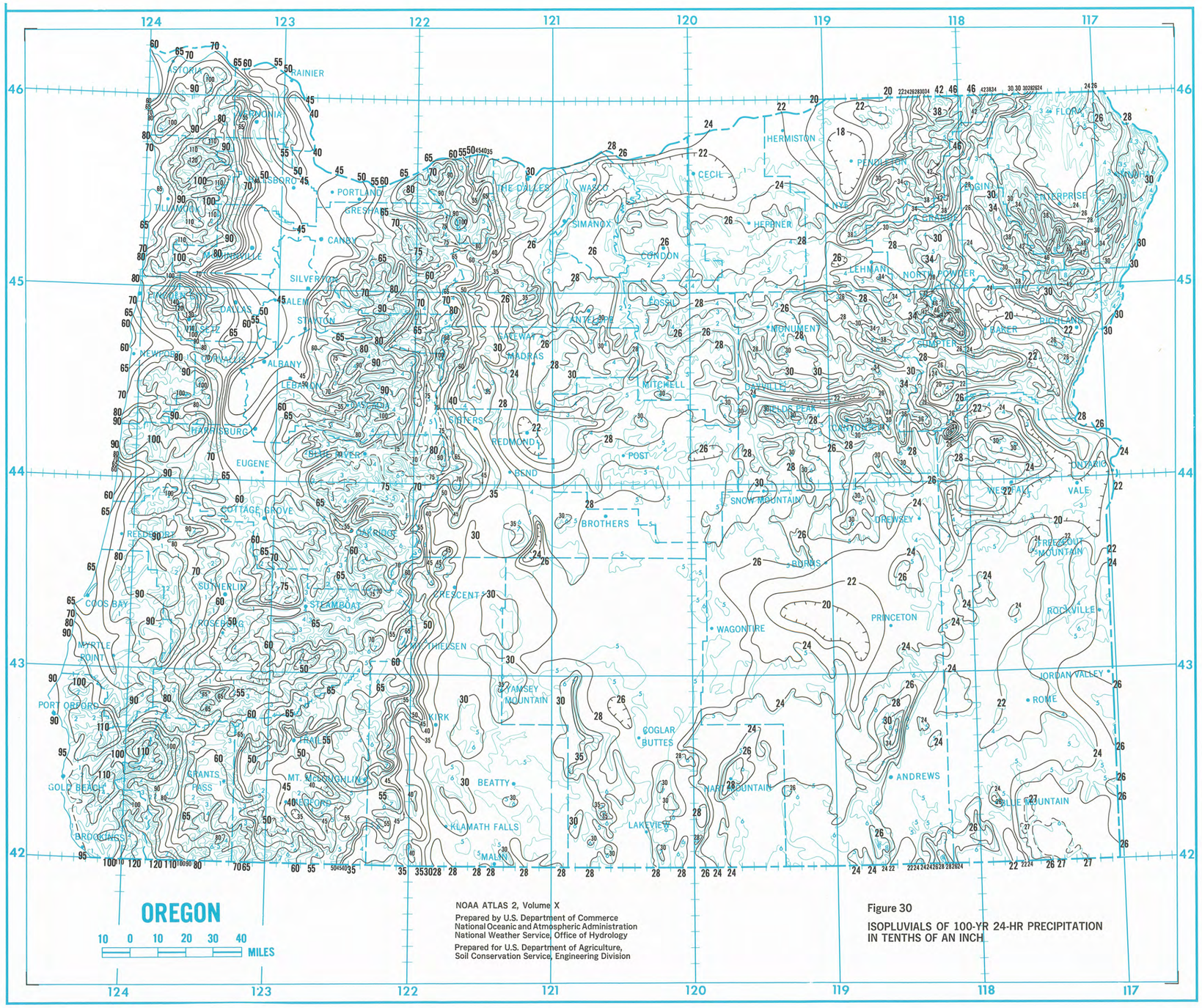

Figure 30

ISOPLUVIALS OF 100-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH

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Elysian Subdivision
McMinnville, Oregon
Stormwater Management Report

APPENDIX IV

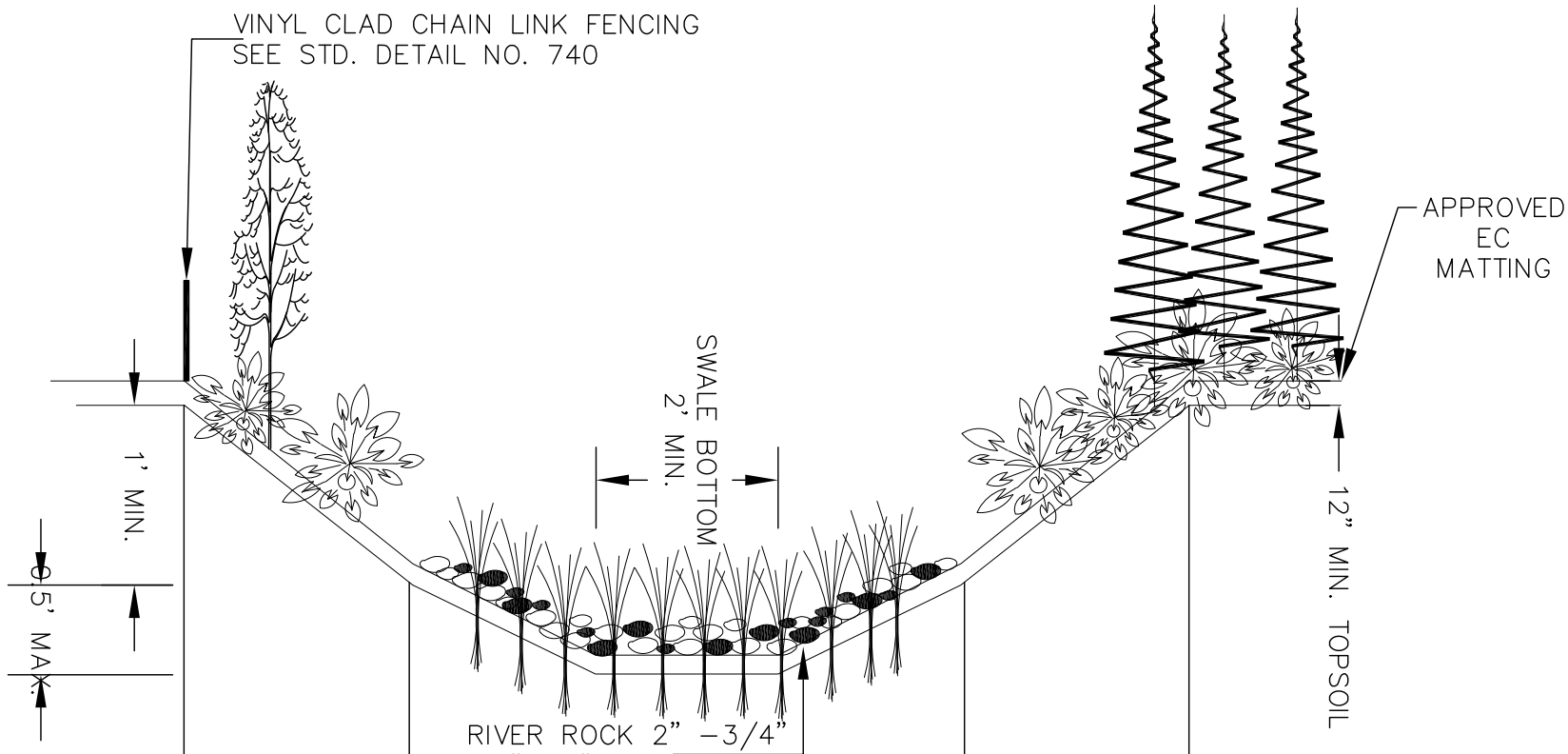
Operation & Maintenance Plans

VEGETATED SWALES

WATER QUALITY SWALE

DRAWING NO. 700

REVISED 12-06



SWALE AREA	FREEBOARD AREA	TREATMENT AREA 6' MINIMUM WIDTH			FREEBOARD AREA	BUFFER/MITIGATION AREA
EC MATTING	ECONOJUTE*	COCONUT FIBER OR GEOJUTE PLUS*			ECONOJUTE*	ECONOJUTE* (S> 20%)
SEED MIX	LOW GROW MIX SEE NOTE #5	NONE			LOW GROW MIX SEE NOTE #5	AS APPROVED BY DISTRICT OR CITY
MAX. SLOPE	2.5:1	4:1	FLAT BOTTOM	4:1	2.5:1	NA

* OR AS APPROVED

NOTES:

1. REFER TO APPENDIX A, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS.
2. PROVIDE IRRIGATION AS APPROVED BY CWS.
3. JUTE MATTING- GEOJUTE PLUS IN TREATMENT AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILIAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
4. 12-INCHES OF TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUALITY TRACT.
5. FREEBOARD AREA SEED MIX, DWARF TALL FESCUE 40%, DWARF PERENIAL RYE 30%, CREEPING RED FESCUE 25%, COLONIAL BENT GRASS 5%. APPLY AT A RATE OF 120# / ACRE.

Clean Water Services

CONSTRUCTION

1. Water Quality Swale shall be over-excavated and filled to final grade with 12-inch amended topsoil. Topsoil amendments shall be garden compost, not conventional fertilizer amendments.
2. A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the swale cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Anchor spacing shall be based on 3 fps flow over the fabric.
    a. Treatment area - high-density jute matting (Geojute Plus or other approved equal)
    b. All other areas - low-density jute matting (Econojute or other approved equal)
3. 2.5-3 inches of 2"-$\frac{3}{4}$" river run rock shall be placed over the matting evenly throughout the length and width of the swale.
4. Plant materials shall be placed in accordance with the plan and plant table as shown on approved plans.
5. The water quality swale treatment area plantings can be deemed "substantially complete" once active green growth has occurred to an average growth of 3" and plant density is an average of approx. 6 plants (minimum 1-inch plugs or equivalent) per square foot.
6. The facility shall be deemed acceptable to begin the maintenance period when plant growth and density matches the engineer's design as shown on the approved plans and all other requirements have been met. The engineer must certify the facility to be functional, in accordance with the approved plan design to begin the two-year maintenance period.

MAINTENANCE

1. The permittee is responsible for the maintenance of this facility for a minimum of two years following construction and acceptance of this facility per Chapter 2.
2. Irrigation is to be provided per separate irrigation plan as approved.
   Note: Irrigation needs are to be met using a temporary irrigation system with a timer during the dry season. Systems should be winterized during the wet season to assure longevity and guard against damage from freezing temperatures. Water source shall be as shown on the approved plans.
3. Engineer or Owners Representative is to visit and evaluate the site a minimum of twice annually (Spring and Fall). The landscaping shall be evaluated and replanted as necessary to ensure a minimum of 80% survival rate of the required vegetation and 90% aerial coverage. Non-native, invasive plant species shall be removed when occupying more than 20% of the site.
4. The facility shall be re-excavated and planted if siltation greater than 3 inches in depth occurs within the two-year maintenance period.

WATER QUALITY SWALE CONSTRUCTION & MAINTENANCE NOTES

DETAIL NO. 710

REVISED 12-06

Clean Water Services

PLANTING REQUIREMENTS

Appendix A

PLANTING REQUIREMENTS

1.0 INTRODUCTION

1.1 General

The District recognizes the importance of Water Quality Sensitive Areas, Vegetated Corridors, and Stormwater Facilities that, along with the Tualatin River, are under its jurisdiction. To improve water quality and preserve aquatic species, and meet the intent of both the federal Clean Water and the Endangered Species Acts, the District developed requirements for planting of Vegetated Corridors, Sensitive Areas, and Stormwater Facilities.

Successful revegetation is critical to the proper function of Sensitive Areas, Vegetated Corridors, and Stormwater Facilities for the benefit of water quality and quantity management, and aquatic species preservation. This Appendix aids professionals, the development community, and field crews in planning, designing and implementing successful revegetation projects in these areas. This document guides design decisions to promote successful planting efforts, while allowing flexibility to address opportunities and constraints at each site.

1.2 Jurisdiction

Most Sensitive Areas are regulated by the Division of State Lands (DSL) and/or the U.S. Army Corps of Engineers (Corps). Where the Corps and/or DSL permit mitigation, planting plans for these areas shall follow DSL and Corps guidelines and approved plans. Vegetated Corridors and Stormwater Facilities are regulated by the District and the plans and management strategies for these areas shall follow the steps outlined in this document. Alternative plans and management strategies may be approved by the District.

1.3 Professional Assistance

Revegetation in Sensitive Areas, Vegetated Corridors and Stormwater Facilities should facilitate succession toward low-maintenance plant communities. Consultation with a professional landscape architect, ecologist, or horticulturist knowledgeable in native plants is highly recommended when preparing plans. Satisfying the landscaping requirements may require the services of a registered landscape architect. See ORS 671.310 through 671.459.

Non-native, invasive plant management and wildlife damage management strategies are provided in Clean Water Services *Integrated Pest Management (IPM) Plan*. Especially challenging management situations may require assistance from a landscape maintenance contractor or a wildlife biologist.

2.0 PLANTING PLAN METHODS

Planting plans shall be required for development projects with Vegetated Corridors or Stormwater Facilities. When a planting plan is required, four major components shall be addressed: hydrology, soils, plant materials, and maintenance. When developing planting plans, the following steps should be used:

2.1 Step 1: Assess Hydrologic and Hydraulic Conditions

a. Determine the frequency and duration of water inundation, including appropriate elevations of the revegetation area. Watershed hydrology and hydraulic models for major streams are available from the District. In some cases, current site conditions (i.e. wetland presence) will suffice. For Stormwater Facilities, the models used to design and size the facility shall be used to determine frequency, duration and surface water elevations within the facility.

b. Assign appropriate hydrologic zones to the revegetation area and apply them to the plan. Most project sites include one or more of the following planting zones with respect to hydrology during the growing season:

1. Wet - standing or flowing water/nearly constant saturation; anaerobic soils

2. Moist - periodically saturated; anaerobic and/or aerobic soils

3. Dry - infrequent inundation/saturation, if any; aerobic soils

2.2 Step 2: Assess Soil Conditions and Assign Appropriate Preparation Specifications to Plans

a. Determine the organic content and non-native, invasive seed bank likely in the soil. For most Stormwater Facilities, the soil is often high in clay, gravel, or minerals devoid of topsoil and organic material, and/or high in non-native, invasive weed content. The conditions in Sensitive Areas and Vegetated Corridors vary greatly.

b. For upland sites with at least one foot of native topsoil, but containing a non-native, invasive seed bank or plants, add notes to the plan to remove the undesirable plants, roots, and seeds (*see IPM Plan*) prior to planting.

c. For upland sites with either disturbed and compacted soils or less than one foot of topsoil and invasive, non-native seed bank or plants that have become established, the following notes shall be added to the plan:

1. Remove the undesirable plants, roots, and seeds (*see IPM Plan*) prior to adding topsoil.

2. Till the sub-grade in these areas to a depth of at least four inches and add at least 12 inches of clean compost-amended topsoil. The compost-amended topsoil shall have the following characteristics to ensure a good growing medium:
   A) Texture – material passes through one-inch screen
   B) Fertility – 35% organic matter

3. In the event of floodplain grading, over-excavate the sub grade to ensure 12 inches of topsoil can be applied without impacting surface water elevations.

d. For wet areas in Sensitive Areas and Stormwater Facilities, the soil conditions shall be hydric or graded to hold sufficient water to promote hydric soil formation. The addition of organic muck soil will improve plant establishment for some bulbs and tubers.

e. Where appropriate and necessary for erosion control or to enhance organic matter, leaf compost may be placed uniformly on topsoil. (Refer to Chapter 6, Erosion Prevention and Sediment Control). Other amendments, conditioners, and bio-amendments may be added as needed to support the specified plants or adjust the soil pH. Traditional fertilization techniques (applying N-P-K) are not necessary for native plants.

2.3 Step 3: Identify Plants to be Preserved, Select Revegetation Plant Materials, Quantities, Placement, and Assign Planting Zones and Specifications to Plans

a. Preservation: Every effort shall be made to protect a site's existing native vegetation. Native vegetation along Sensitive Areas and Vegetated Corridors shall be retained to the maximum extent practicable.

b. Selection: Plant selection shall be from a native species palette and shall consider site soil types, hydrologic conditions, and shade requirements. Containerized or bare root plants may be used. A list of common native plant community types appropriate for planting Sensitive Areas, Vegetated Corridors and Stormwater Facilities is provided in Table A-1. Upon approval from the District, limited use of non-invasive non-native plants may be permitted in highly urbanized and other unique settings such as regional town centers. Unless approved by District staff, planting restrictions are limited to the following:

1. Deep rooting trees and shrubs (e.g. willow) shall not be planted on top of concrete pipes, or within 10 feet of retaining walls, inlet/outlet structures or other culverts; and

2. Large trees or shrubs shall not be planted on berms over four feet tall that impound water. Small trees or shrubs with fibrous root systems may be installed on berms that impound water and are less than four feet tall.

c. Quantities:

1. Vegetated Corridors and Sensitive Areas
Trees and shrubs shall be planted using the following equations to achieve the specified densities on a per acre basis.

A) Total number of trees per acre = area in square feet x 0.01
B) Total number of shrubs per acre = area in square feet x 0.05
C) Groundcover = plant and seed to achieve 100% areal coverage

2. Stormwater Facilities
A) Stormwater Facilities in tracts or easements less than 30 feet wide shall be planted using the following equations to achieve the specified densities on a per acre basis:
i. Total number of shrubs per acre = area in square feet x 0.05
ii. Groundcover = plant and seed to achieve 100% areal coverage
B) Stormwater Facilities in tracts or easements 30 feet wide or more shall be planted using the following equations to achieve the specified densities on a per acre basis:
i. Total number of trees per acre = area in square feet x 0.01
ii. Total number of shrubs per acre = area in square feet x 0.05
iii. Groundcover = plant and seed to achieve 100% areal coverage

d. Size: Potted plants shall follow size requirements outlined in Table A-1. Bare root plants shall be 12 to 16 inches long.

e. Placement: Plant placement shall be consistent with naturally occurring plant communities. Trees and shrubs shall be placed in singles or clusters of the same species to provide a natural planting scheme. This arrangement may follow curved rows to facilitate maintenance. Distribution and relative abundance shall be dependant on the plant species and on the size of the revegetation area. The Vegetated Corridor revegetation area shall be overseeded with native seed mixes appropriate to the plant community and hydrologic zone of the site (see Table A-1: Plant Communities for Revegetation). Plant placement and seeding shall promote maximum vegetative cover to minimize weed establishment.

2.4 Step 4: Determine Plant Installation Requirements and Assign Specifications to Plans

a. Timing
Containerized stock shall be installed only from February 1 through May 1 and October 1 through November 15. Bare root stock shall be installed only from December 15 through April 15. Plantings outside these times may require additional measures to ensure survival which shall be specified on the plans.

b. Erosion Control
Grading, soil preparation, and seeding shall be performed during optimal weather conditions and at low flow levels to minimize sediment impacts. Site disturbance shall be minimized and desirable vegetation retained, where possible. Slopes shall be graded to support the establishment of vegetation. Where seeding is used for erosion control, an appropriate native grass, Regreen (or its equivalent), or sterile wheat shall be used to stabilize slopes until permanent vegetation is established. Biodegradable fabrics (coir, coconut or approved jute matting (minimum 1/4" square holes) may be used to stabilize slopes and channels. Fabrics such as burlap may be used to secure plant plugs in place and to discourage floating upon inundation. No plastic mesh that can entangle wildlife is permitted. Consult Chapter 6 - Erosion Prevention and Sediment Control for additional information.

c. Mulching
Trees, shrubs, and groundcovers planted in upland areas shall be mulched a minimum of three inches in depth and 18 inches in diameter, to retain moisture and discourage weed growth around newly installed plant material. Appropriate mulches are made from composted bark or leaves that have not been chemically treated. The use of mulch in frequently inundated areas shall be limited, to avoid any possible water quality impacts including the leaching of tannins and nutrients, and the migration of mulch into waterways.

d. Plant Protection from Wildlife
Depending on site conditions, appropriate measures shall be taken to limit wildlife-related damage (*see IPM Plan*).

e. Irrigation
Appropriate plant selection, along with adequate site preparation and maintenance, reduces the need for irrigation. However, unless site hydrology is currently adequate, a District/City approved irrigation system or equivalent (i.e., polymer, plus watering) shall be used during the two-year plant establishment period. Watering shall be at a minimum rate of at least one inch per week from June 15 through October 15. Other irrigation techniques, such as deep watering, may be allowed with prior approval by District staff.

f. Access
Maintenance access for plant maintenance shall be provided for Sensitive Areas and Vegetated Corridors via a five-foot easement or shared boundary with Stormwater Facilities. Stormwater Facilities access requirements are provided in Chapter 4.

2.5 Step 5: Determine Plant Monitoring and Maintenance Requirements

a. Monitoring
Site visits are necessary throughout the growing season to assess the status of the plantings, irrigation, mulching, etc. and ensure successful revegetation.

b. Weed Control
The removal of non-native, invasive weeds shall be necessary throughout the maintenance period, or until a healthy stand of desirable vegetation is established (*see IPM Plan*).

c. Plant Replacement and Preservation
Installed plants that fail to meet the acceptance criteria (see Chapter 2) shall be replaced during the maintenance period. Prior to replacement, the cause of loss (wildlife damage, poor plant stock, etc.) shall be documented with a description of the corrective actions taken.

2.6 Step 6: Prepare Construction Documents and Specifications

The construction documents and specifications shall include:

a. Sensitive Area and Vegetated Corridor boundaries as shown on the Service Provider Letter, including limits of approved, temporary construction encroachment. Orange construction fencing shall be noted at Vegetated Corridor boundaries as well as at encroachment limits during construction. Note permanent type fencing and signage between the development and the Vegetated Corridor for project completion is required.

b. Site Preparation plan and specifications, including limits of clearing, existing plants and trees to be preserved, and methods for removal and control of invasive, non-native species, and location and depth of topsoil and or compost to be added to revegetation area.

c. Planting plan and specifications, including all of the following:
   1. Planting table that documents the common name, scientific name, distribution (zone and spacing), condition and size of plantings
   2. Installation methods for plant materials
   3. Mulching
   4. Plant tagging for identification
   5. Plant protection
   6. Seeding mix, methods, rates, and areas

d. Irrigation plan and specifications, including identification of water source, watering timing and frequency, and maintenance of the system.

e. Maintenance schedule; including responsible party and contact information, dates of inspection (minimum three per growing season and one prior to onset of growing season) and estimated maintenance schedule (as necessary) over the two-year monitoring period.

f. Easement descriptions for all Vegetated Corridor and Sensitive Areas that are required as part of the development.

g. Good rated corridor notes i.e. invasive species removal resulting in cleared areas exceeding 25 square feet shall be replanted with native vegetation.

h. Access points for installation and maintenance including vehicle access if available.

i. Standard drawing details (north arrow, scale bar, property boundaries, project name, drawing date, name of designer and Property Owner).

TABLE A-1
SUGGESTED PLANT COMMUNITIES FOR REVEGETATION

Plant Commiunities	Minimum Species Composition	Plant Category	Water Requirements	Light Requirements	Minimum Rooting Size	Minimum Plant Height	Spacing Format
Riparian Forest (RF)							
Red alder (Alnus rubra)	X	Tree	Moist	Sun	1 gal	3'	Single
Western red cedar (Thuja plicata)	X	Tree	Moist	Shade	2 gal	2'	Single
Red elderberry (Sambucus racemosa)	X	Shrub	Moist	Part	1 gal	1.5'	Single
Black twinberry (Lonicera involcrata)		Shrub	Moist	Part	1 gal	1.5'	Single
Red-osier dogwood (Cornus stoniferia)	X	Shrub	Wet	Part	1 gal	2'	Cluster
Indian plum (Oemleris cerasiformis)	X	Shrub	Moist	Shade	2 gal	2'	Cluster
Swamp rose (Rosa pisocarpa)		Shrub	Moist	Part	1 gal	1.5'	Cluster
Pacific ninebark (Pysocarpus capitatus)		Shrub	Moist	Shade	1 gal	2'	Single
Snowberry (Symphoricarpos albus)	X	Shrub	Dry	Part	1 gal	1.5'	Cluster
Salmonberry (Rubus spectabilis)	X	Shrub	Moist	Shade	1 gal	1.5'	Cluster
Maidenhair fern (Adiatum aleuticum)		Herb	Moist	Shade	4"	na	Cluster
Lady fern (Athyrium filix-femina)		Herb	Moist	Shade	1 gal	na	Cluster
Skunk cabbage (Lysichiton americanum)		Herb	Wet	Shade	bulbs	na	Cluster
False lily-of-the-valley (Maianthemum dilatatum)		Herb	Moist	Shade	bulbs, 4"	na	Cluster
Candy flower (Claytonia sibirica)		Herb	Moist	Shade	4"	na	Cluster
Miners lettuce (Montia perfoliata)		Herb	Moist	Shade	4"	na	Cluster
Stream violet (Viola glabella)		Herb	Moist	Shade	4"	na	Cluster
Youth-on-age (Tolmiea menziesii)		Herb	Moist	Shade	4"	na	Cluster
Insideout flower (Vancouveria hexandra)		Herb	Moist	Shade	4"	na	Cluster
Dewey's sedge (Carex deweyana)		Herb	Dry	Shade	plugs, 4"	4"	Mass
Hair bentgrass (Agrostis scabra)		Grass	Moist	Part	seed	na	Mass
Spike bentgrass (Agrostis exarata)	X	Grass	Moist	Part	seed	na	Mass
Tall manna-grass (Glyceria elata)	X	Grass	Moist	Part	seed	na	Mass

Plant Commiunities	Minimum Species Composition	Plant Category	Water Requirements	Light Requirements	Minimum Rooting Size	Minimum Plant Height	Spacing Format
Upland Forest (UF)							
Red alder (Alnus rubra)	X	Tree	Moist	Sun	1 gal	3'	Single
Big leaf maple (Acer macrophyllum)	X	Tree	Dry	Sun	2gal	3'	Single
Douglas Fir (Pseudotsuga menziesii)	X	Tree	Dry	Sun	2gal	3'	Single
Grand fir (Abies grandis)	X	Tree	Dry	Sun	2 gal	2'	Single
Pacific yew (Taxus brevifolia)		Tree	Moist	Shade	2 gal	2'	Single
Cascara (Rhamnus purshiana)		Tree	Dry	Part	2 gal	2'	Single
Pacific dogwood (Cornus nuttallii)		Tree	Moist	Shade	1 gal	2'	Single
Bitter cherry (Prunus emarginata)		Tree	Moist	Part	2 gal	2'	Single
Vine Maple (Acer circinatum)	X	Tree	Moist	Part	2 gal	2'	Single
Oceanspray (Holodiscus discolor)	X	Shrub	Dry	Sun	1 gal	1.5'	Single
Red elderberry (Sambucus racemosa)	X	Shrub	Moist	Part	1 gal	1.5'	Single
Red flowering currant (Ribes sanguineum)	X	Shrub	Dry	Sun	1 gal	1.5'	Cluster
Cascade Oregon grape (Mahonia nervosa)		Shrub	Moist	Part	1 gal	4"	Cluster
Tall Oregon grape (Mahonia aquifolium)		Shrub	Dry	Sun	1 gal	6"	Single
Red huckleberry (Vaccinium parvifolium)		Shrub	Moist	Shade	1 gal	1.5'	Cluster
Thimbleberry (Rubus pariflorus)		Shrub	Moist	Shade	1 gal	1.5'	Cluster
Snowberry (symphoricarpos albus)	X	Shrub	Dry	Part	1 gal	1.5'	Cluster
Baldhip Rose (Rosa gymnocarpa)	X	Shrub	Dry	Part	1 gal	1.5'	Cluster
Serviceberry (Almelanchier alnifolia)		Shrub	Dry	Part	2 gal	2'	Single
Sword fern (Polystichum munitum)		Shrub	Moist	Shade	2 gal	na	Cluster
Deer fern (Blechnum spicant)		Herb	Moist	Shade	1 gal	na	Cluster
Orange honeysuckle (Lonicera ciliosa)		Herb	Moist	Shade	2 gal	na	Single
Salal (Gaultheria shallon)		Herb	Moist	Part	1 gal	4"	Cluster
Wood strawberry (Fragaria vesca)		Herb	Moist	Shade	4"	na	Cluster
Western trillium (Trillium ovatum)		Herb	Moist	Shade	4"	na	Cluster
Five-stemmed mitrewort (Mitella pentandra)		Herb	Moist	Shade	1 gal	na	Cluster
Red columbine (Aquilegia formosa)		Herb	Dry	Part	4"	na	Cluster
False solomon's seal (Smilacina racemosa)		Herb	Moist	Shade	4"	na	Cluster
Native California brome (Bromus carinatus)	X	Grass	Dry	Sun	seed	na	Mass
Blue Wildrye (Elymus glaucus)	X	Grass	Dry	Part	seed	na	Mass

Plant Commiunities	Minimum Species Composition	Plant Category	Water Requirements	Light Requirements	Minimum Rooting Size	Minimum Plant Height	Spacing Format
Oak Woodland / Savanna (OW)							
Oregon white oak (Quercus garryana)	X	Tree	Dry	Sun	2 gal	2'	Single
Snowberry (Symphoricarpos albus)	X	Shrub	Dry	Part	1 gal	1.5'	Cluster
Serviceberry (Almelanchier alnifolia)	X	Shrub	Dry	Part	1 gal	2'	Single
Oceanspray (Holodiscus discolor)	X	Shrub	Dry	Sun	1 gal	1.5'	Cluster
Training blackberry (Rubus ursinus)		Shrub	Dry	Sun	1 gal	1.5'	Cluster
Cascade Oregon grape (Mahonia nervosa)		Herb	Moist	Part	1 gal	4"	Cluster
Blue wild-rye (Elymus glacus)	X	Grass	Dry	Part	seed	na	Mass
Native California brome (Bromus carinatus)	X	Grass	Dry	Sun	seed	na	Mass
Ash Forested Wetland (FW)							
Oregon Ash (Fraxinus latifolia)	X	Tree	Moist	Part	2 gal	3'	Single
Pacific Ninebark (Physocarpus capitatus)	X	Shrub	Moist	Shade	2 gal	2'	Single
Red-osier dogwood (Cornus sericea)	X	Shrub	Wet	Part	1 gal	2'	Cluster
Snowberry (Symphoricarpus albus)	X	Shrub	Dry	Part	1gal	1.5'	Cluster
Slough sedge (Carex obnupta)	X	Herb	Moist	Part	plugs	6"	Mass
Candy flower (Claytonia sibirica)		Herb	Moist	Shade	4"	na	Cluster
Streambank springbeauty (Montia parvifolia)		Herb	Moist	Shade	4"	na	Cluster
Dewey's sedge (Carex deweyana)		Herb	Dry	Shade	plugs	4"	Mass
Small fruited bulrush (Scirpus microcarpus)		Herb	Wet	Sun	plugs	4"	Mass
Tall mannagrass (Glyceria elata)	X	Grass	Moist	Shade	seed	na	Mass

Plant Commiunities	Minimum Species Composition	Plant Category	Water Requirements	Light Requirements	Minimum Rooting Size	Minimum Plant Height	Spacing Format
Shrub / Scrub Wetland (SS)							
Pacific willow (Salix lasiandra)	X	Tree	Wet	Sun	1 gal	3'	Single
Sitka willow (Salix sitchensis)		Tree	Moist	Sun	1 gal	3'	Cluster
Douglas hawthorne (Crataegus douglasii)		Tree	Moist	Part	2 gal	2'	Cluster
Pacific Crabapple (Malus fusca)	X	Tree	Moist	Part	2 gal	2'	Cluster
Scouler willow (Salix scouleriana)	X	Shrub	Moist	Sun	1 gal	3'	Cluster
Red-osier dogwood (Cornus sericea)	X	Shrub	Wet	Part	1 gal	2'	Cluster
Clustered rose (Rosa pisocarpa)		Shrub	Wet	Part	1 gal	1.5'	Cluster
Douglas's spiraea (Spiraea douglasii)	X	Shrub	Wet	Sun	1 gal	1.5'	Cluster
Nodding beggartick (Bidens cernua)		Herb	Wet	Sun	1 gal	1.5'	Cluster
Spreading rush (Juncus patens)		Herb	Moist	Part	plugs	6"	Mass
Western manna-grass (Glyceria occidentalis)	X	Grass	Wet	Sun	seed	na	Mass
Emergent Marsh (EM)							
Nodding beggarstick (Bidens cernua)	X	Herb	Moist	Sun	1 gal	1.5'	Cluster
Hardstem bulrush (Scirpus acutus)		Herb	Wet	Sun	plugs	1.5'	Cluster
Small-fruited bulrush (Scirpus microcarpus)	X	Herb	Wet	Sun	plugs	6"	Mass
Creeping spike rush (Eleocharis palustris)	8	Herb	Wet	Sun	seed, plugs	4"	Mass
Wapato (Sagittaria latifolia)		Herb	Wet	Sun	bulbs	na	Cluster
American water plantain (Alisma plantago-aquatica)		Herb	Wet	Sun	bulbs	na	Cluster
Soft stemmed bulrush (Scirpus taberaemontani)		Herb	Wet	Sun	plugs	1.5'	Cluster
American brooklime (Veronica americana)		Herb	Wet	Sun	plugs	na	Cluster
Marsh speedwell (Veronica scutellata)		Herb	Wet	Sun	plugs	na	Cluster
American sloughgrass (Beckmannia syzigachne)	X	Grass	Wet	Sun	seed, plugs	na	Mass
Western manna-grass (Glyceria occidentalis)	X	Grass	Wet	Sun	seed	na	Mass

Plant Commiunities	Minimum Species Composition	Plant Category	Water Requirements	Light Requirements	Minimum Rooting Size	Minimum Plant Height	Spacing Format
Storm Water Facility (SWF)							
Oregon Ash (Fraxinus latifolia)		Tree	Moist	Part	2 gal	3'	Single
Vine Maple (Acer circinatum)	X	Tree	Moist	Part	2 gal	2'	Single
Cascara (Rhamnus purshiana)		Tree	Moist/Dry	Part	1 gal	2'	Single
Bitter cherry (Prunus emarginata)		Tree	Moist	Part	2 gal	2'	Single
Mock orange (Philadelphus lewisii)		Shrub	Wet/dry	Part	1 gal	2'	Cluster
Red-osier dogwood (Cornus sericea)	X	Shrub	Wet	Part	1 gal	2'	Cluster
Pacific ninebark (Pysocarpus capitatus)		Shrub	Moist	Shade	1 gal	2'	Single
Oceanspray (Holodiscus discolor)	X	Shrub	Dry	Sun	1 gal	1.5'	Single
Serviceberry (Almelanchier alnifolia)	X	Shrub	Dry	Part	1 gal	2'	Single
Clustured rose (Rosa pisocarpa)		Shrub	Moist	Sun	1 gal	1.5'	Cluster
Snowberry (Symphoricarpus albus)	X	Shrub	Dry	Part	1gal	1.5'	Cluster
Douglas's spiraea (Spiraea douglasii)	X	Shrub	Wet	Sun	1 gal	1.5'	Cluster
Red flowering currant (Ribes sanguineum)	X	Shrub	Dry	Sun	1 gal	1.5'	Cluster
Nodding beggartick (Bidens cernua)		Herb	Wet	Sun	1 gal	1.5'	Cluster
Spreading rush (Juncus patens)		Herb	Moist	Part	plugs	6"	Mass
Small-fruited bulrush (Scirpus microcarpus)		Herb	Wet	Sun	plugs	6"	Mass
Slough sedge (Carex obnupta)	X	Herb	Moist	Part	plugs	6"	Mass
Toad rush (Juncus bufonius)*		Herb	Dry	Sun	seed, plugs	4"	Mass
Rossi Sedge (Carex rossi)*		Herb	Moist	Sun	plugs	4"	Mass
NW Native Wildflower mix		Herb	Mix	Sun	seed	na	Mass
Oregon Bentgrass (Agrostis oregonesis)*	X	Grass	Dry	Sun	seed	na	Mass
Idaho bentgrass (Agrostis idahoensis)*		Grass	Dry	Sun	seed	na	Mass
Western manna-grass (Glyceria occidentalis)		Grass	Wet	Sun	seed	na	Mass

* - Grows 5-30 cm tall

APPENDIX V

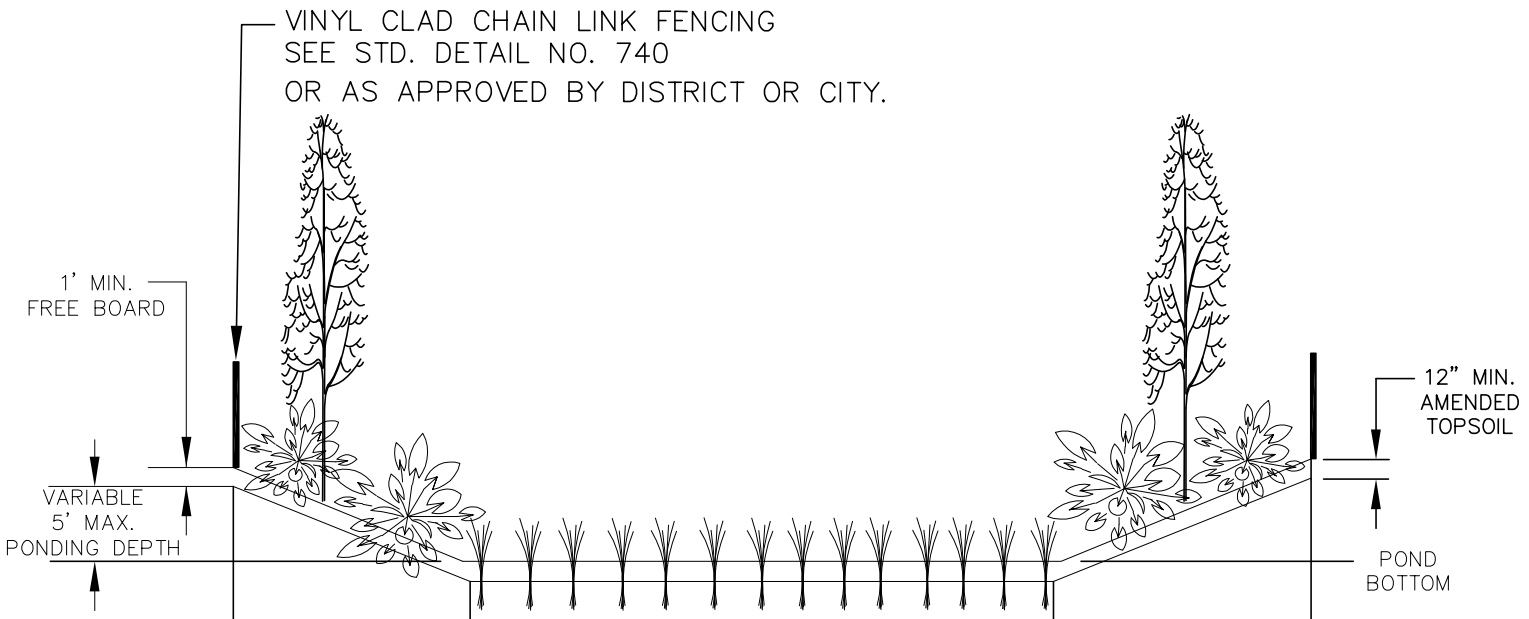
Detail Drawings/Specifications

VEGETATED SWALES

DETENTION POND

DRAWING NO. 700

REVISED 10-31-19



	SIDE SLOPE AREA	DETENTION AREA 6' MINIMUM WIDTH	SIDE SLOPE AREA
EC MATTING	ECONOJUTE*	COCONUT FIBER OR GEOJUTE PLUS*	ECONOJUTE*
SEED MIX	LOW GROW MIX SEE NOTE #5	NONE	LOW GROW MIX SEE NOTE #5
MAX. SLOPE	3H:1V TYP	FLAT BOTTOM	3H:1V TYP

* OR AS APPROVED

NOTES:

1. REFER TO CHAPTER 4, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS.
2. PROVIDE IRRIGATION AS APPROVED BY CWS.
3. JUTE MATTING– GEOJUTE PLUS IN DETENTION AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILIAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
4. 12 INCHES OF AMENDED TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUANTITY FACILITY.
5. SIDE SLOPE AREA SEED MIX, DWARF TALL FESCUE 40%, DWARF PERENNIAL RYE 30%, CREEPING RED FESCUE 25%, COLONIAL BENT GRASS 5%. APPLY AT A RATE OF 120# / ACRE.

Clean Water Services

CONSTRUCTION

1. Detention Pond shall be over-excavated and filled to final grade with 12-inch amended topsoil. Topsoil amendments shall be garden compost, not conventional fertilizer amendments.
2. A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the Detention Pond cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Anchor spacing shall be based on 3 fps flow over the fabric.
    a. Pond bottom - high-density jute matting (Geojute Plus or other approved equal)
    b. All other areas - low-density jute matting (Econojute or other approved equal)
3. Plant materials shall be placed in accordance with the plan and plant table as shown on approved plans.
4. The facility shall be deemed acceptable to begin the maintenance period when plant growth and density matches the Engineer's design as shown on the approved plans and all other requirements have been met. The Engineer must certify the facility to be functional, in accordance with the approved plan design to begin the two-year maintenance period..

MAINTENANCE

1. The permittee is responsible for the maintenance of this facility for a minimum of two years following construction and acceptance of this facility per Chapter 2.
2. Irrigation is to be provided per separate irrigation plan as approved.
   Note: Irrigation needs are to be met using a temporary irrigation system with a timer during the dry season. Systems should be winterized during the wet season to assure longevity and guard against damage from freezing temperatures. Water source shall be as shown on the approved plans.
3. Engineer or Owner's Representative is required to perform Monitoring and Maintenance of the Site and provide Documentation as required in Appendix A, 2.5 of the Design and Construction Standards. The Approved Plans shall include a Maintenance Schedule per Appendix A, 2.6.e of the Design and Construction Standards.
4. The Facility shall be re-excavated and planted if siltation greater than 3 inches in depth occurs within the two-year maintenance period.

DETENTION POND
CONSTRUCTION & MAINTENANCE NOTES

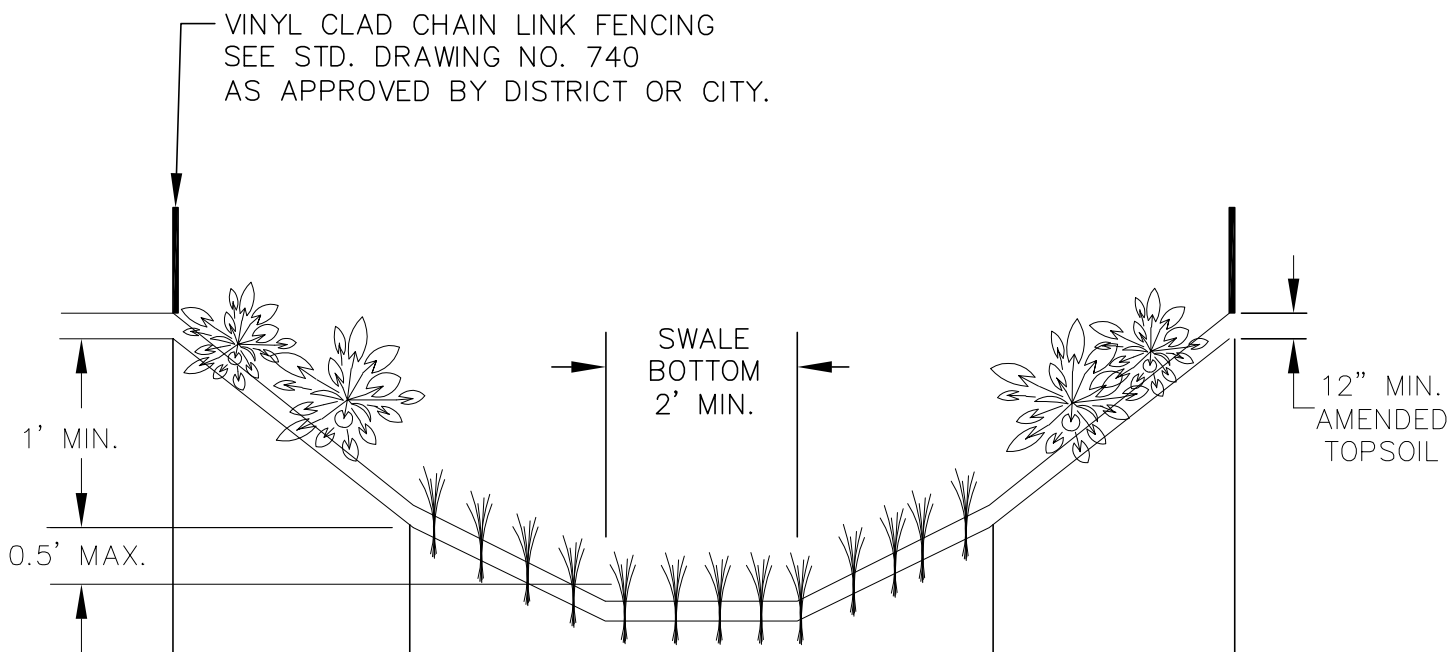
DETAIL NO. 701 REVISED 10-31-19

Clean Water Services

WATER QUALITY SWALE

DRAWING NO. 705

REVISED 10-31-19



SWALE AREA	SIDE SLOPE AREA	TREATMENT AREA 6' MINIMUM WIDTH			SIDE SLOPE AREA
EC MATTING	ECONOJUTE*	COCONUT FIBER OR GEOJUTE PLUS*			ECONOJUTE*
SEED MIX	LOW GROW MIX SEE NOTE #5	NONE			LOW GROW MIX SEE NOTE #5
MAX. SLOPE	2.5H:1V	4H:1V TYP	FLAT BOTTOM	4H:V1	2.5H:V1

* OR AS APPROVED

NOTES:

1. REFER TO CHAPTER 4, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS.
2. PROVIDE IRRIGATION AS APPROVED BY CWS.
3. JUTE MATTING– GEOJUTE PLUS IN TREATMENT AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILIAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
4. 12 INCHES OF AMENDED TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUALITY FACILITY.
5. FREEBOARD AREA SEED MIX, DWARF TALL FESCUE 40%, DWARF PERENNIAL RYE 30%, CREEPING RED FESCUE 25%, COLONIAL BENT GRASS 5%. APPLY AT A RATE OF 120# / ACRE.

Clean Water Services

CONSTRUCTION

1. Water Quality Facility shall be over-excavated and filled to final grade with 12-inch amended topsoil. Topsoil amendments shall be garden compost, not conventional fertilizer amendments.
2. A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the swale cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Anchor spacing shall be based on 3 fps flow over the fabric.
    a. Treatment area - high-density jute matting (Geojute Plus or other approved equal)
    b. All other areas - low-density jute matting (Econojute or other approved equal)
3. Plant materials shall be placed in accordance with the plan and plant table as shown on approved plans.
4. The water quality facility treatment area plantings can be deemed "substantially complete" once active green growth has occurred to an average growth of 3" and plant density is an average of approx. 6 plants (minimum 1-inch plugs or equivalent) per square foot.
5. The facility shall be deemed acceptable to begin the maintenance period when plant growth and density matches the engineer's design as shown on the approved plans and all other requirements have been met. The engineer must certify the facility to be functional, in accordance with the approved plan design to begin the two-year maintenance period.

MAINTENANCE

5. The permittee is responsible for the maintenance of this facility for a minimum of two years following construction and acceptance of this facility per Chapter 2.
6. Irrigation is to be provided per separate irrigation plan as approved.
   Note: Irrigation needs are to be met using a temporary irrigation system with a timer during the dry season. Systems should be winterized during the wet season to assure longevity and guard against damage from freezing temperatures. Water source shall be as shown on the approved plans.
7. Engineer or Owner's Representative is required to perform Monitoring and Maintenance of the Site and provide Documentation as required in Appendix A, 2.5 of the Design and Construction Standards. The Approved Plans shall include a Maintenance Schedule per Appendix A, 2.6.e of the Design and Construction Standards.
8. The facility shall be re-excavated and planted if siltation greater than 3 inches in depth occurs within the two-year maintenance period.

WATER QUALITY SWALE CONSTRUCTION & MAINTENANCE NOTES

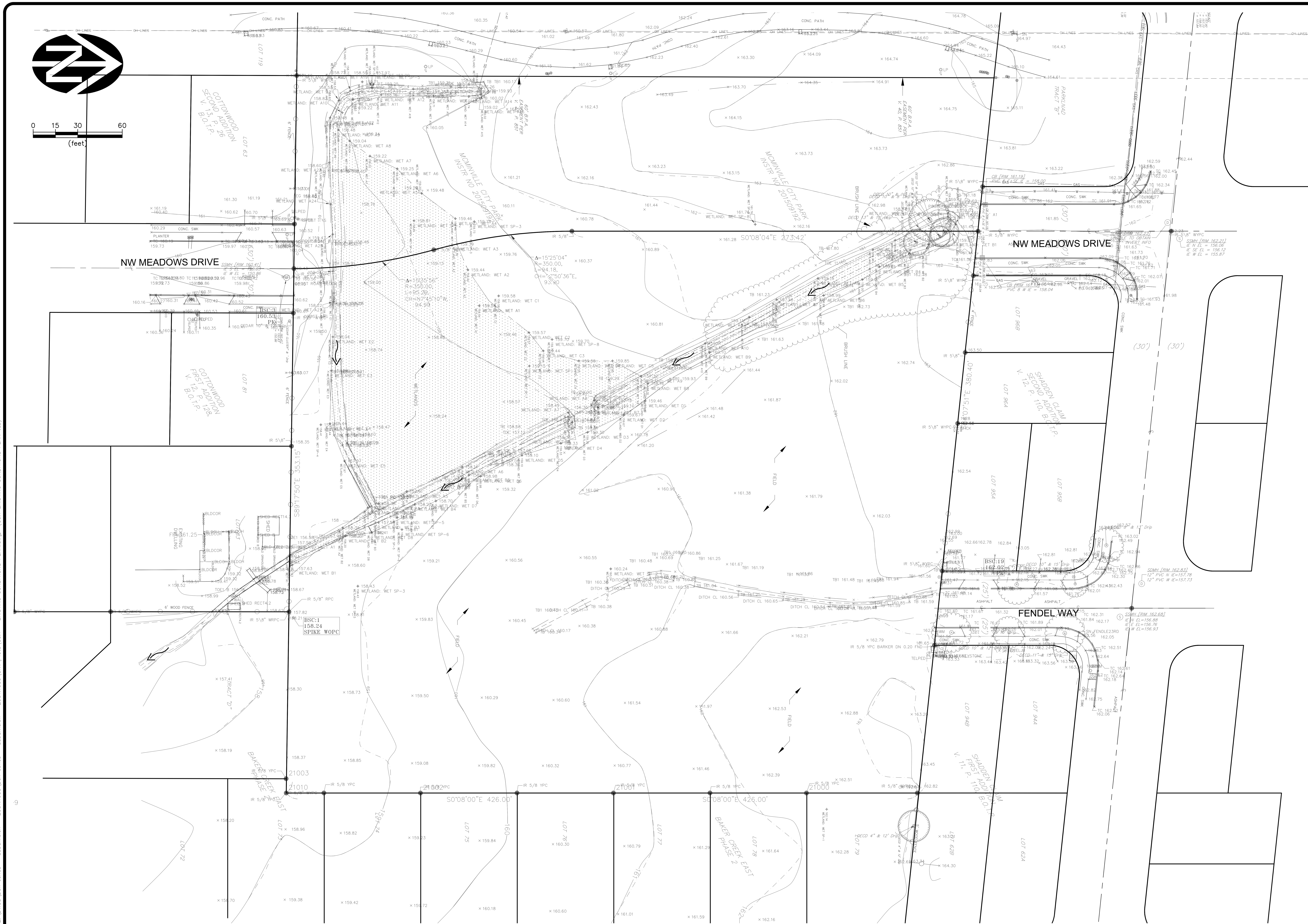
DETAIL NO. 706

REVISED 10-31-19

Clean Water Services

APPENDIX VI

Supplemental Civil Drawings



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E:\DWGS\Don Jones - Subdivision - 2931.1000\Civil\Plots\C0.1 - EXISTING CONDITIONS PLAN.dwg, (C0.1 EXISTING CONDITIONS PLAN tab)

NO.	DATE	DESCRIPTION	BY
1			

REVISIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: AUG 2022

REGISTERED PROFESSIONAL ENGINEER
OREGON
NOV. 12, 2008
WILLIAM J. WELLS
RENEWS: 6/30/2022

REVIEW

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

EXISTING CONDITIONS PLAN

DRAWING
C0.1

JOB NUMBER
2931.0000.0

0 15 30 60
(feet)

NO WORK THIS SIDE OF FENCE

ORANGE SILT FENCE

INSTALL TEMPORARY 24"SD

BIO BAGS (TYP.)

GRAVEL CONSTRUCTION ENTRANCE

SILT SACKS DOWNSTREAM

CB

NW MEADOWS DRIVE

NO WORK IN WETLANDS UNTIL PERMITS ARE ISSUED.

GRAVEL CONSTRUCTION ENTRANCE

SILT SACKS (TYP.)

NW MEADOWS DRIVE

GRAVEL CONSTRUCTION ENTRANCE

FENDEL WAY

23RD STREET

NOTES:
1. NO WORK IN WETLANDS PRIOR TO PERMITTING

DEMOLITION LEGEND
- (S) SAWCUT AT DIRECTION OF CITY
- (R) CONTRACTOR TO REMOVE

EROSION CONTROL LEGEND
- SILT SACK
- BIO BAGS
- SILT FENCE
- = WETLANDS

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 06/22/2022

REVIEW REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 1979
WILLIAM J. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
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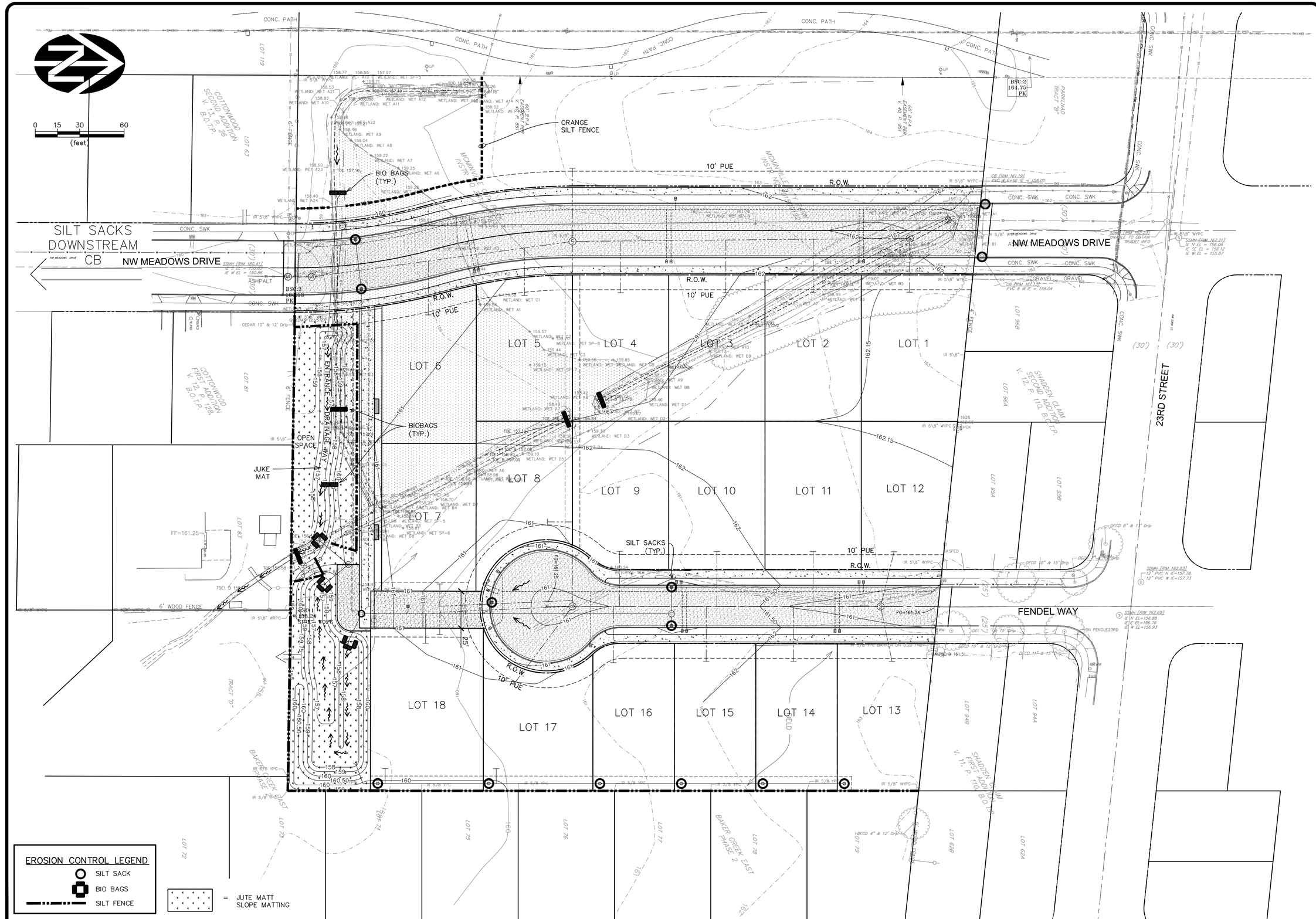
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

PRE-DEVELOPED EROSION CONTROL PLAN

DRAWING
C1.0

JOB NUMBER
2931.0000.0



NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

VERIFY SCALE
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IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 06/22/2022

REVIEW REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 1979
WILLIAM J. WELLS

RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
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VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

POST EROSION CONTROL PLAN

DRAWING
C1.1

JOB NUMBER
2931.0000.0

DEQ EROSION CONTROL STANDARD NOTES:

1. Hold a pre–construction meeting of project construction personnel that includes the inspector to discuss erosion and sediment control measures and construction limits. (Schedule A.8.c.i.(3))
2. All inspections must be made in accordance with DEQ 1200–C permit requirements. (Schedule A.12.b and Schedule B.1)
3. Inspection logs must be kept in accordance with DEQ's 1200–C permit requirements. (Schedule B.1.c and B.2)
4. Retain a copy of the ESCP and all revisions on site and make it available on request to DEQ, Agent, or the local municipality. During inactive periods of greater than seven (7) consecutive calendar days, the above records must be retained by the permit registrant but do not need to be at the construction site. (Schedule B.2.c)
5. All permit registrants must implement the ESCP. Failure to implement any of the control measures or practices described in the ESCP is a violation of the permit. (Schedule A 8.a)
6. The ESCP must be accurate and reflect site conditions. (Schedule A.12.c.i)
7. Submission of all ESCP revisions is not required. Submittal of the ESCP revisions is only under specific conditions. Submit all necessary revision to DEQ or Agent within 10 days. (Schedule A.12.c.iv. and v)
8. Phase clearing and grading to the maximum extent practical to prevent exposed inactive areas from becoming a source of erosion. (Schedule A.7.a.iii)
9. Identify, mark, and protect (by construction fencing or other means) critical riparian areas and vegetation including important trees and associated rooting zones, and vegetation areas to be preserved. Identify vegetative buffer zones between the site and sensitive areas (e.g., wetlands), and other areas to be preserved, especially in perimeter areas. (Schedule A.8.c.i.(1) and (2))
10. Preserve existing vegetation when practical and re–vegetate open areas. Re–vegetate open areas when practicable before and after grading or construction. Identify the type of vegetative seed mix used. (Schedule A.7.a.v)
11. Maintain and delineate any existing natural buffer within the 50–feet of waters of the state. (Schedule A.7.b.i.and (2(a)(b))
12. Install perimeter sediment control, including storm drain inlet protection as well as all sediment basins, traps, and barriers prior to land disturbance. (Schedule A.8.c.i.(5))
13. Control both peak flow rates and total stormwater volume, to minimize erosion at outlets and downstream channels and streambanks. (Schedule A.7.c)
14. Control sediment as needed along the site perimeter and at all operational internal storm drain inlets at all times during construction, both internally and at the site boundary. (Schedule A.7.d.i)
15. Establish concrete truck and other concrete equipment washout areas before beginning concrete work. (Schedule A.8.c.i.(6))
16. Apply temporary and/or permanent soil stabilization measures immediately on all disturbed areas as grading progresses. Temporary or permanent stabilizations measures are not required for areas that are intended to be left unvegetated, such as dirt access roads or utility pole pads.(Schedule A.8.c.ii.(3))
17. Establish material and waste storage areas, and other non–stormwater controls. (Schedule A.8.c.i.(7))
18. Prevent tracking of sediment onto public or private roads using BMPs such as: construction entrance, graveled (or paved) exits and parking areas, gravel all unpaved roads located onsite, or use an exit tire wash. These BMPs must be in place prior to land–disturbing activities. (Schedule A 7.d.ii and A.8.c.i(4))
19. When trucking saturated soils from the site, either use water–tight trucks or drain loads on site. (Schedule A.7.d.ii.(5))
20. Control prohibited discharges from leaving the construction site, i.e., concrete wash–out, wastewater from cleanout of stucco, paint and curing compounds. (Schedule A.6)
21. Use BMPs to prevent or minimize stormwater exposure to pollutants from spills; vehicle and equipment fueling, maintenance, and storage; other cleaning and maintenance activities; and waste handling activities. These pollutants include fuel, hydraulic fluid, and other oils from vehicles and machinery, as well as debris, fertilizer, pesticides and herbicides, paints, solvents, curing compounds and adhesives from construction operations. (Schedule A.7.e.i.(2))
22. Implement the following BMPs when applicable: written spill prevention and response procedures, employee training on spill prevention and proper disposal procedures, spill kits in all vehicles, regular maintenance schedule for vehicles and machinery, material delivery and storage controls, training and signage, and covered storage areas for waste and supplies. (Schedule A. 7.e.iii.)
23. Use water, soil–binding agent or other dust control technique as needed to avoid wind–blown soil. (Schedule A 7.a.iv)
24. The application rate of fertilizers used to reestablish vegetation must follow manufacturer's recommendations to minimize nutrient releases to surface waters. Exercise caution when using time–release fertilizers within any waterway riparian zone. (Schedule A.9.b.iii)
25. If an active treatment system (for example, electro–coagulation, flocculation, filtration, etc.) for sediment or other pollutant removal is employed, submit an operation and maintenance plan (including system schematic, location of system, location of inlet, location of discharge, discharge dispersion device design, and a sampling plan and frequency) before operating the treatment system. Obtain plan approval before operating the treatment system. Operate and maintain the treatment system according to manufacturer's specifications. (Schedule A.9.d)
26. Temporarily stabilize soils at the end of the shift before holidays and weekends, if needed. The registrant is responsible for ensuring that soils are stable during rain events at all times of the year. (Schedule A 7.b)
27. As needed based on weather conditions, at the end of each workday soil stockpiles must be stabilized or covered, or other BMPs must be implemented to prevent discharges to surface waters or conveyance systems leading to surface waters. (Schedule A 7.e.ii.(2))
28. Construction activities must avoid or minimize excavation and bare ground activities during wet weather. (Schedule A.7.a.i)
29. Sediment fence: remove trapped sediment before it reaches one third of the above ground fence height and before fence removal. (Schedule A.9.c.i)
30. Other sediment barriers (such as biobags): remove sediment before it reaches two inches depth above ground height and before BMP removal. (Schedule A.9.c.i)
31. Catch basins: clean before retention capacity has been reduced by fifty percent. Sediment basins and sediment traps: remove trapped sediments before design capacity has been reduced by fifty percent and at completion of project. (Schedule A.9.c.iii& iv)
32. Within 24 hours, significant sediment that has left the construction site, must be remediated. Investigate the cause of the sediment release and implement steps to prevent a recurrence of the discharge within the same 24 hours. Any in–stream clean–up of sediment shall be performed according to the Oregon Division of State Lands required timeframe. (Schedule A.9.b.i)
33. The intentional washing of sediment into storm sewers or drainage ways must not occur. Vacuuming or dry sweeping and material pickup must be used to cleanup released sediments. (Schedule A.9.b.ii)
34. The entire site must be temporarily stabilized using vegetation or a heavy mulch layer, temporary seeding, or other method should all construction activities cease for 30 days or more. (Schedule A.7.f.i)
35. Provide temporary stabilization for that portion of the site where construction activities cease for 14 days or more with a covering of blown straw and a tackifier, loose straw, or an adequate covering of compost mulch until work resumes on that portion of the site. (Schedule A.7.f.ii)
36. Do not remove temporary sediment control practices until permanent vegetation or other cover of exposed areas is established. Once construction is complete and the site is stabilized, all temporary erosion controls and retained soils must be removed and disposed of properly, unless doing so conflicts with local requirements. (Schedule A.8.c.iii(1) and D.3.c.ii and iii)

Rev. 12/15/15 By: Krista Ratliff

YEAR: / MONTH:	'20 06	'20 07	'20 08	'20 09	'20 10	'20 11	'20 12	'21 01	'21 02	'21 03	'21 04	'21 05
CLEARING	X	X	X									
EXCAVATION	X	X	X									
GRADING	X	X	X	X	X							
CONSTRUCTION	X	X	X	X	X	X	X	X	X	X	X	X
SEDIMENT CONTROLS:												
Silt Fencing	X	X	X	X	X	X	X	X	X	X	X	X
Sediment Traps	X	X	X	X	X	X	X	X	X	X	X	X
Sediment Basins	X	X	X	X	X	X	X	X	X	X	X	X
Storm Inlet Protection	X	X	X	X	X	X	X	X	X	X	X	X
Drainage Swales												
Check Dams												
Contour Furrows												
Terracing												
Pipe Slope Drains												
Rock Outlet Protection												
Gravel Construction Entrance												
Grass–lined Channel (Turf Reinforcement Mats)												
Protection of trees with construction fences												
Temporary Seeding and Planting												
Permanent Seeding and Planting					X	X	X	X	X	X	X	X
Other:												

CONTROL MEASURE	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Silt Fencing	X	X	X	X	
Construction Entrance					
Sediment Traps	X	X	X	X	
Storm Inlet Protection			X	X	
Concrete Washout					
Rock Outlet Protection					
Permanent Seeding and Planting					X

Phase 1: Prior to Ground Disturbance
Phase 2: After Completion of Rough Grading
Phase 3: After Installation of Storm Facilities
Phase 4: After Paving & Construction
Phase 5: After Project Completion and Cleanup

INSPECTION FREQUENCY FOR BMP

Site Condition	Minimum Frequency
1. Active period	Daily when stormwater runoff, including runoff from snowmelt, is occurring. At least once every 14 days, regardless of whether stormwater runoff is occurring.
2. Prior to the site becoming inactive or in anticipation of site inaccessibility.	Once to ensure that erosion and sediment control measures are in working order. Any necessary maintenance and repair must be made prior to leaving the site.
3. Inactive periods greater than seven (14) consecutive calendar days	Once every month.
4. Periods during which the site is inaccessible due to inclement weather	If practical, inspections must occur daily at a relevant and accessible discharge point or downstream location.
5. Periods during which discharge is unlikely due to frozen conditions	Monthly. Resume monitoring immediately upon melt, or when weather conditions make discharge likely.

BMP Rationale

A comprehensive list of available Best Management Practices (BMP) options based on DEQ's 1200–C Permit Application and ESCP Guidance Document has been reviewed to complete this Erosion and Sediment Control Plan. Some of the above listed BMPs were not chosen because they were determined to not effectively manage erosion prevention and sediment control for this project based on specific site conditions, including soil conditions, topographic constraints, accessibility to the site, and other related conditions. As the project progresses and there is a need to revise the ESCP, an Action Plan will be submitted.

SOIL TYPE(S): PER MARION CO. SOIL SURVEY THE SITE SOILS INCLUDE, "WOODBURN SILT LOAM, 0 TO 3 PERCENT SLOPES"

EROSION HAZARD: PER MARION CO. SOIL SURVEY EROSION HAZARD RANGES FROM "SLIGHT".

SITE AREA: 3.79 AC

DISTURBANCE AREA: 4.10 AC

LOCAL RAIN GAGE: MCMINNVILLE MUNICIPAL AIRPORT OR, US
LAT/LONG 45.194, –123.1368

SUPPLEMENTAL WESTECH NOTES:

1. Erosion control measures shall be maintained in such a manner as to ensure that sediment and sediment–laden water does not enter the drainge system, roadways, or violate applicable water quality standards.
2. The erosion control construction, maintenance, replacement and upgrading of the erosion control facilities is the responsibility of the Contractor until all construction is completed and approved, and permanent erosion control (i.e. vegetation/landscaping) is established on all disturbed areas.
3. All recommended erosion control procedures are dependent on construction methods, staging, site conditions, weather and scheduling. During the construction period, erosion control facilities shall be upgraded as necessary due to unexpected storm events and to ensure that sediment and sediment laden water does not leave the site.
4. The Contractor is responsible for control of sediment transport within project limits. If an installed erosion control system does not adequately contain sediment on site, then the erosion control measures shall be adjusted or supplemented by the Contractor as necessary to ensure that sediment laden water does not leave the site. Additional measures shall be provided as required to ensure that all paved areas are kept clean for the duration of the project. Additional interim measures will include, at a minimum, installation of silt fences in accordance with the details shown on the drawings. These measures shall be installed along all exposed embankments and cut slopes to prevent sediment transport.
5. All existing and newly constructed storm inlets and drains shall be protected until pavement surfaces are completed and/or vegetation is established.
6. Erosion control facilities and sediment fences on active sites shall be inspected by the Contractor at least daily during any period with measurable precipitation. Any required repairs or maintenance shall be completed immediately. The erosion control facilities on inactive sites shall be inspected and maintained by the Contractor a minimum of once a month or within 24 hours following the start of a storm event.
7. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment–laden water into the downstream system. The Contractor shall remove all accumulated sediment from all impacted catch basins and storm pipes prior to acceptance by the Owner.
8. The Contractor is solely responsible for protection of all adjacent property and downstream facilities from erosion and siltation during project construction. Any damage resulting from such erosion and siltation shall be corrected at the sole expense of the Contractor.
9. The Contractor shall provide site watering as necessary to prevent wind erosion of fine–grained soils.
10. Unless otherwise indicated on the drawings, all temporary erosion control facilities, including sediment fences, silt sacks, bio–bags, etc. shall be removed by the Contractor within 30 days after permanent landscaping/vegetation is established.
11. Sediment fences shall be constructed of continuous filter fabric to avoid use of joints. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum 6–inch overlap, and both ends securely fastened to a post.
12. Sediment fence shall be installed per drawing details. Sediment fences shall have adequate support to contain all silt and sediment captured.
13. The standard strength filter fabric shall be fastened securely to stitched loops installed on the upslope side of the posts, and 6 inches of the fabric shall be extended into the trench. The fabric shall not extend more than 30 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
14. Bio–filter bags shall be clean 100 percent wood product waste. Bags shall be 18–inch x 18–inch x 30–inch, weigh approximately 45 lbs., and be contained in a bag made of 1/2–inch plastic mesh.
15. Sediment barriers shall be maintained until the up–slope area has been permanently stabilized. At no time shall more than 10–inches of sediment be allowed to accumulate behind sediment fences. No more than 2 inches of sediment shall be allowed to accumulate behind bio–filter bags. Sediment shall be removed prior to reaching the above stated depths. New sediment barriers shall be installed uphill as required to control sediment transport.
16. Stabilized construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures may be required to ensure that all paved areas are kept clean for the duration of the project.
17. The Contractor shall verify that all trucks are well sealed when transporting saturated soils from the site. Water drippage from trucks transporting saturated soils must be reduced to less than 1 gallon per hour prior to leaving the site.
18. The entrance shall be maintained in a condition that will prevent tracking or flow of mud onto the public right–of–way or approved access point. The entrance may require periodic top dressing as conditions demand, and repair and/or cleanout of any structures used to trap sediment.
19. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately, and the Contractor shall provide protection of downstream inlets and catch basins to ensure sediment laden water does not enter the storm drain system.
20. Temporary grass cover measures must be fully established by October 15th, or other cover measures (ie. erosion control blankets with anchors, 3–inches minimum of straw mulch, 6 mil HDPE plastic sheet, etc.) shall be in place over all disturbed soil areas until April 30th. To establish an adequate grass stand for controlling erosion by October 15th, it is recommended that seeding and mulching occur by September 1st. Straw mulch, if used, shall not leave any bare ground visible through the straw.
21. Minimum wet weather slope protection. For slopes steeper than 3H:1V but less than 2H:1V, use Tensar/North American Green Type S150 erosion control blanket. For slopes 2H:1V or steeper, use Tensar/North American Green Type SC150 erosion control blanket. Use a minimum of 2–inches straw mulch or Tensar/North American Green Type S150 for slopes flatter than 3H:1V. Slope protection shall be placed on all disturbed areas immediately after completion of each section of construction activity, until the erosion control seeding has been established. As an option during temporary or seasonal work stoppages, a 6–mil HDPE plastic sheet may be placed on exposed slopes. The plastic sheet shall be provided with an anchor trench at the top and bottom of the slope, and shall be sandbagged on the slopes as required to prevent damage or displacement by wind.
22. Permanent erosion control vegetation on all embankments and disturbed areas shall be re–established as soon as construction is completed.
23. Soil preparation. Topsoil should be prepared according to landscape plans, if available, or recommendations of grass seed supplier. It is recommended that slopes be textured before seeding by rack walking (ie. driving a crawling tractor up and down the slopes to leave a pattern of cleat imprints parallel to slope contours) or other method to provide stable areas for seeds to rest.
24. When used, hydromulch shall be applied with grass seed at a rate of 2000 lbs. per acre between April 30 and June 10, or between September 1 and October 1. On slopes steeper than 10 percent, hydroseed and mulch shall be applied with a bonding agent (tackifier). Application rate and methodology to be in accordance with seed supplier recommendations.
25. When used in lieu of hydromulch, dry, loose, weed free straw used as mulch shall be applied at a rate of 4000 lbs. per acre (double the hydromulch application requirement). Anchor straw by working in by hand or with equipment (rollers, cleat trackers, etc.). Mulch shall be spread uniformly immediately following seeding.
26. When conditions are not favorable to germination and establishment of the grass seed, the Contractor shall irrigate the seeded and mulched areas as required to establish the grass cover.
27. Seeding. Recommended erosion control grass seed mix is as follows. Dwarf grass mix (low height, low maintenance) consisting of dwarf perennial ryegrass (80 % by weight), creeping red fescue (20 % by weight). Application rate shall be 100 lbs. per acre minimum.
28. Grass seed shall be fertilized at a rate of 10 lbs. per 1000 S.F with 16– 16–16 slow release type fertilizer. Development areas within 50 feet of water bodies and wetlands must use a non–phosphorous fertilizer.
29. Prior to starting construction contractor shall acquire the services of a DEQ Certified Erosion and Sediment Control Inspector and shall submit an "Action Plan" to DEQ indentifying their names, contact information, training and experience as required in Schedule A.6.b.i–ii of the 1200–C Permit
30. Contractor shall submit "Notice of Termination" to DEQ to end the 1200–C permit coverage once all soil disturbance activities have been completed and final stabilization of exposed soils has occured.

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH 1
CKD. JW
DATE: 06/22/2006

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 12, 2005
WILLIAM T. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
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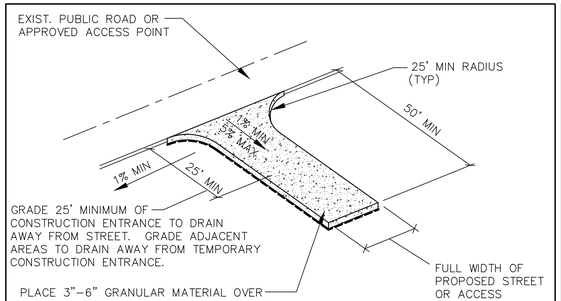
VJ–2 DEVELOPMENT
ELYSIAN SUBDIVISION

EROSION CONTROL NOTES

DRAWING
C1.2

JOB NUMBER
2931.0000.0



DRY WEATHER ACCESS
14–INCH MIN. DEPTH OVER COMPACTED SUBGRADE & FABRIC

WET WEATHER ACCESS
24–INCH MIN. DEPTH OVER UNDISTURBED SUBGRADE & FABRIC

CONSTRUCTION NOTES:

1. THE AREA OF THE CONSTRUCTION ENTRANCE SHALL BE STRIPPED OF ALL TOPSOIL, VEGETATION, ROOTS, AND OTHER NON–COMPACTABLE MATERIAL.
2. SUBGRADE SHALL BE COMPACTED AND PROOFROLLED PRIOR TO PLACEMENT OF GRANULAR MATERIAL. FAILURE TO PASS PROOFROLL WILL REQUIRE USE OF WET WEATHER SECTION.
3. FAILURE OR PUMPING OF THE DRY WEATHER SECTION WILL REQUIRE REMOVAL OF THE GRANULAR MATERIAL AND INSTALLATION OF THE WET WEATHER SECTION.

MAINTENANCE NOTES:

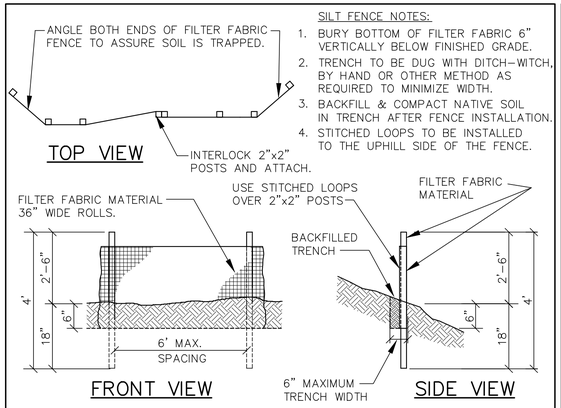
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOW OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 3"–6" INCH STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEAN–OUT OF STRUCTURES USED TO TRAP SEDIMENT.
2. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
3. ALL TRUCKS TRANSPORTING SATURATED SOILS SHALL BE WELL SEALED. WATER DRIPPAGE FROM TRUCKS MUST BE REDUCED TO 1 GALLON PER HOUR PRIOR TO LEAVING THE SITE.

LAST REVISION DATE:	JO #
MAY 2013	STANDARD

TEMPORARY CONSTRUCTION ENTRANCE

(NTS)

WESTECH ENG.	DETAIL NO. 6100



SILT FENCE NOTES:

1. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
2. TRENCH TO BE DUG WITH DITCH–WITCH, BY HAND OR OTHER METHOD AS REQUIRED TO MINIMIZE WIDTH.
3. BACKFILL & COMPACT NATIVE SOIL IN TRENCH AFTER FENCE INSTALLATION.
4. STITCHED LOOPS TO BE INSTALLED TO THE UPHILL SIDE OF THE FENCE.

MAINTENANCE NOTES:

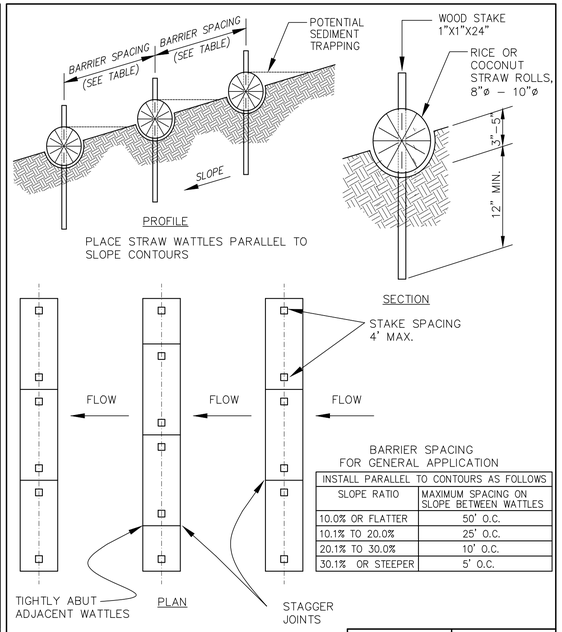
1. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL UP–SLOPE AREA IS PERMANENTLY STABILIZED.
2. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND SEDIMENT FENCES OR BIOFILTER BAGS.
3. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.

LAST REVISION DATE:	JO #
APRIL 2014	STANDARD

SEDIMENT BARRIERS

(NTS)

WESTECH ENG.	DETAIL NO. 6110



BARRIER SPACING FOR GENERAL APPLICATION

INSTALL PARALLEL TO CONTOURS AS FOLLOWS	
SLOPE RATIO	MAXIMUM SPACING ON SLOPE BETWEEN WATTLES
10.0% OR FLATTER	50' O.C.
10.1% TO 20.0%	25' O.C.
20.1% TO 30.0%	10' O.C.
30.1% OR STEEPER	5' O.C.

NOTES:

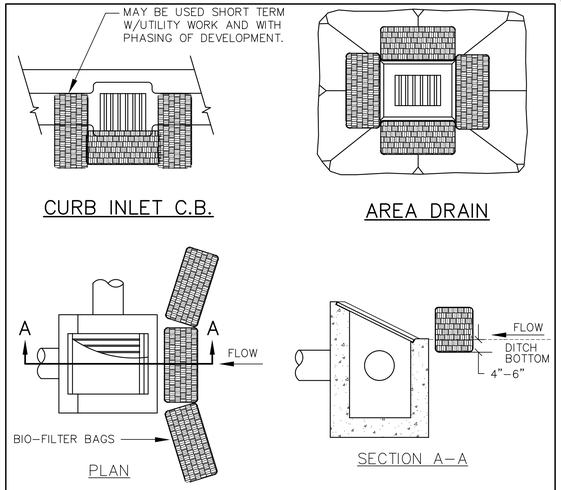
1. ALL MATERIAL SHALL CONFORM TO OSSC (ODOT/APWA) SPECIFICATIONS, CURRENT EDITION.
2. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL UP–SLOPE AREA IS PERMANENTLY STABILIZED.
3. AT NO TIME SHALL SEDIMENT BE ALLOWED TO ACCUMULATE ABOVE THE TOP OF THE STRAW WATTLE.
4. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.

LAST REVISION DATE:	JO #
JUNE 2015	STANDARD

STRAW WATTLE SEDIMENT BARRIER

(NTS)

WESTECH ENG.	DETAIL NO. 6120



DITCH INLET C.B.

MAINTENANCE NOTES:

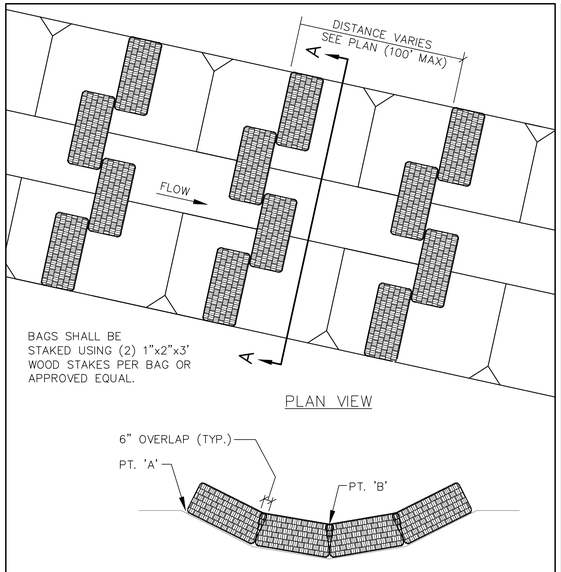
1. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL UP–SLOPE AREA IS PERMANENTLY STABILIZED.
2. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND SEDIMENT FENCES OR BIOFILTER BAGS.
3. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.

LAST REVISION DATE:	JO #
APRIL 2014	STANDARD

INLET SEDIMENT CONTROL

(NTS)

WESTECH ENG.	DETAIL NO. 6130



MAINTENANCE NOTES:

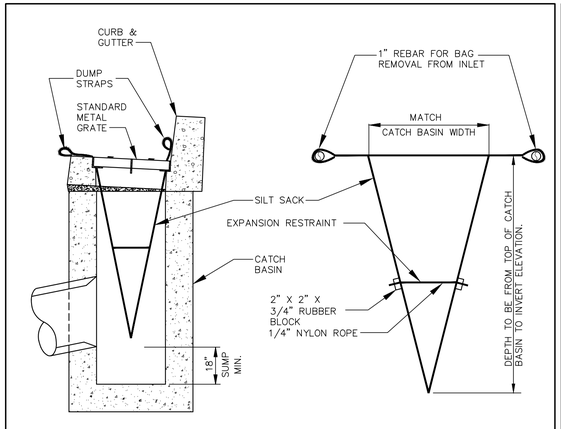
1. SEDIMENT BARRIERS SHALL BE MAINTAINED UNTIL UP–SLOPE AREA IS PERMANENTLY STABILIZED.
2. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND BIOFILTER BAGS.
3. NEW SEDIMENT BARRIERS SHALL BE INSTALLED UPHILL AS REQUIRED TO CONTROL SEDIMENT TRANSPORT.
4. PT. 'A' SHALL BE 6" MIN. HIGHER THAN PT. 'B'.

LAST REVISION DATE:	JO #
APRIL 2014	STANDARD

DITCH AND SWALE EROSION PROTECTION

(NTS)

WESTECH ENG.	DETAIL NO. 6140



NOTES:

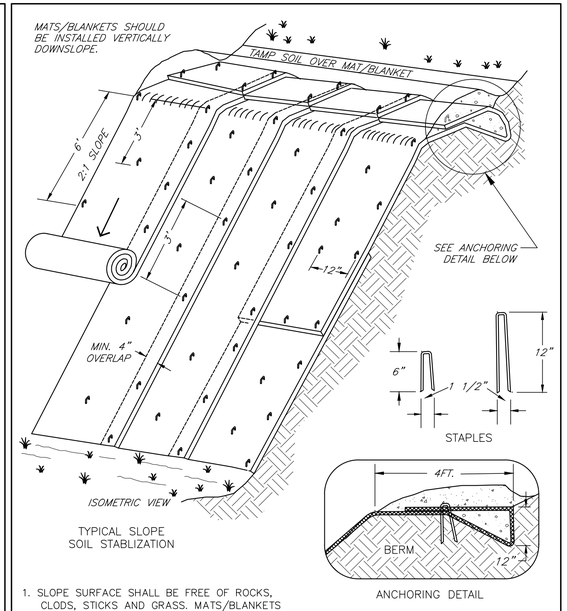
1. EMPTY SILT SACK AS NECESSARY.
2. SILTSACK SEDIMENT CONTROL DEVICE AS MANUFACTURED BY ACF ENVIRONMENTAL AND SUPPLIED BY ACF WEST (503) 771–5115 OR APPROVED EQUAL.

LAST REVISION DATE:	JO #
OCT 2002	STANDARD

SILTSACK INLET DETAIL

(NTS)

WESTECH ENG.	DETAIL NO. 6150



1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MATIAIN DIRECT CONTACT WITH THE SOIL.
4. SEE MANUFACTURER'S SPECIFICATIONS FOR MINIMUM STAKING OR STAPLING LAYOUT PATTERN.
5. STAPLE LENGTH AND QUANTITY VARIES DEPENDING ON SOIL DENSITY. USE 6" STAPLES ON COMPACTED SOILS. USE 12" STAPLES ON LOOSE SOILS.

LAST REVISION DATE:	JO #
OCT. 2019	STANDARD

EROSION CONTROL MAT/BLANKET INSTALLATION

(NTS)

WESTECH ENG.	DETAIL NO. 6180

NO.	DATE	DESCRIPTION REVISIONS	BY
1			

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 05/22/2006

REVIEW REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 2005
WILLIAM T. WELLS

RENEWAL 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585–2474 Fax: (503) 585–3986
E–mail: westech@westech–eng.com

VJ–2 DEVELOPMENT
ELYSIAN SUBDIVISION

EROSION CONTROL DETAILS

DRAWING
C1.3

JOB NUMBER
2931.0000.0

LEGEND	
- - - - -	BUILDING FOOTPRINT

Curve Table

Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C11	95.29	350.00	15.60	S7° 45' 10"E	94.99
C12	94.18	350.00	15.42	S7° 50' 36"E	93.90

● = CONTRACTOR TO SET C/L MONUMENTS. (8"x8" WASHINGTON COUNTY RING & COVER OR EQUAL).

NOTES:
1. 5FT SIDE-YARD SETBACK PROPOSED ON ALL LOTS.

LOT SUMMARY

MIN = 5436 SF
MAX = 8363 SF
AVG = 6294 SF

EXISTING ZONES: R-1

GROSS AREA: 3.79 ACRES

NET AREA: 3.03 ACRES
(W/OUT ROW)

TL: 4 418 TL 204

PHASE II
PHASE I
PHASE BOUNDARY
LOT 1 AREA: 6940 S.F.
LOT 2 AREA: 6424 S.F.
LOT 3 AREA: 6422 S.F.
LOT 4 AREA: 6420 S.F.
LOT 5 AREA: 6267 S.F.
LOT 6 AREA: 6340 S.F.
LOT 7 AREA: 6358 S.F.
LOT 8 AREA: 5748 S.F.
LOT 9 AREA: 6287 S.F.
LOT 10 AREA: 6500 S.F.
LOT 11 AREA: 6500 S.F.
LOT 12 AREA: 5974 S.F.
LOT 13 AREA: 5992 S.F.
LOT 14 AREA: 5473 S.F.
LOT 15 AREA: 5475 S.F.
LOT 16 AREA: 5436 S.F.
LOT 17 AREA: 6365 S.F.
LOT 18 AREA: 8363 S.F.
BUILDING FOOTPRINT
TRACT A OPEN SPACE AREA=15,086 SF TOTAL AREA=16,925 SF
NW MEADOWS DRIVE
NW FENDLE WAY
EXTG. SAN.
EXTG. 8" WATER
60' B.P.A. EASEMENT PER V. 40, P. 851
30' DEDICATION BY OWNER
30' DEDICATION BY CITY OF MCMINNVILLE
10' PUBLIC STORM EASEMENT
10' PUBLIC ACCESS EASEMENT
10' PUBLIC SS EASEMENT
10' PUE
PUBLIC UTILITIES AND ACCESS EASEMENT
10' DRAINAGE EASEMENT
10' WIDE PEDESTRIAN CONNECTION
4' TALL BLACK VINYL FENCE
12' WIDE GATE
PROTECTED WETLANDS
BENCH
WETLAND AREA
21000
21001
21002
21010

0 15 30 60
(feet)

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1			

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. AK
CKD. JW
DATE: 05/20/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 2004 WILLIAM T. WELLS
RENEWS: 6/30/2022

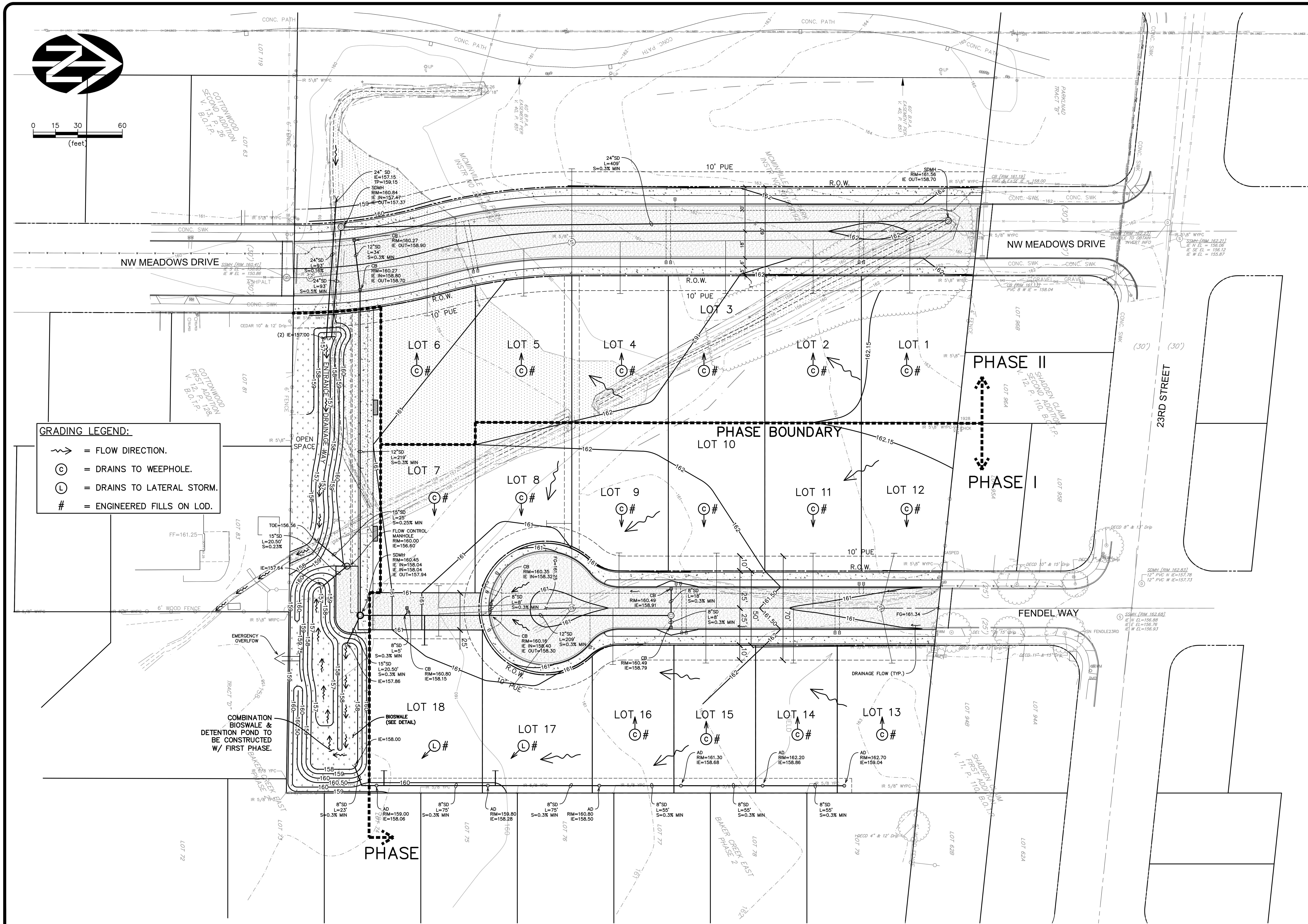
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

OVERALL SUBDIVISION PLAN

DRAWING
C2.0

JOB NUMBER
2931.0000.0



VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN.	JW
DRN.	IH/AK
CKD.	JW
DATE:	05/2008

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

REVIEW REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
NOV. 12, 2008
WILLIAM J. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
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E-mail: westech@westech-eng.com

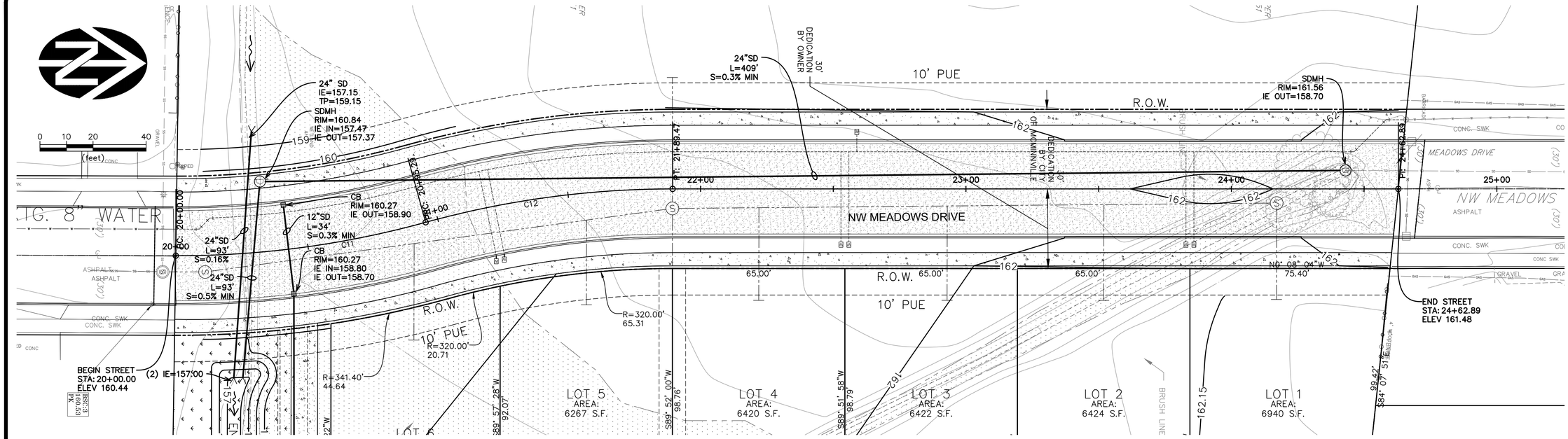
VJ-2 DEVELOPMENT

ELYSIAN SUBDIVISION

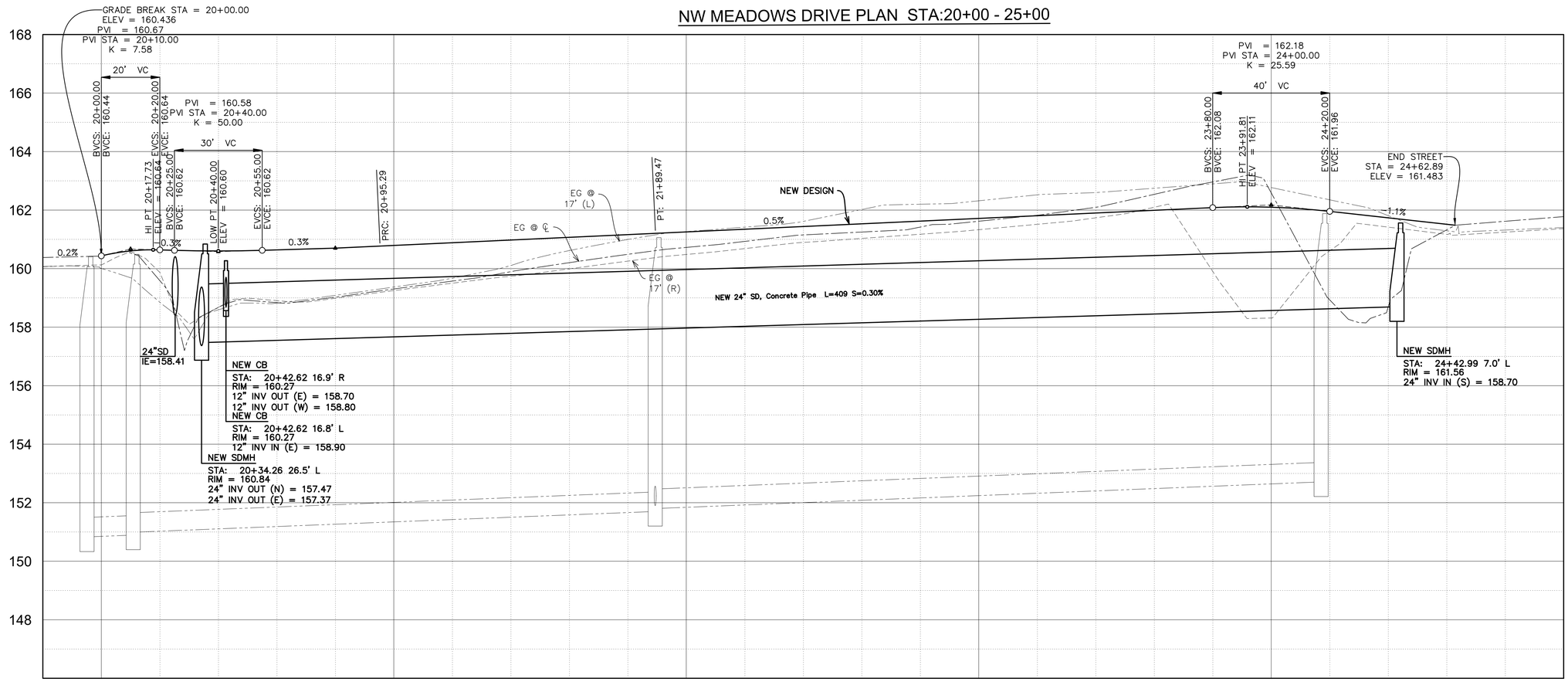
OVERALL GRADING AND DRAINAGE PLAN

DRAWING
C3.0

JOB NUMBER
2931.0000.0



NW MEADOWS DRIVE PLAN STA:20+00 - 25+00



NW MEADOWS DRIVE PROFILE STA:20+00-25+00

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

VERIFY SCALE
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0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. AK/IH
CKD. JW
DATE: 05/20/2022

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 1976 WILLIAM T. WELLS
RENEWS: 6/30/2022

REVIEW

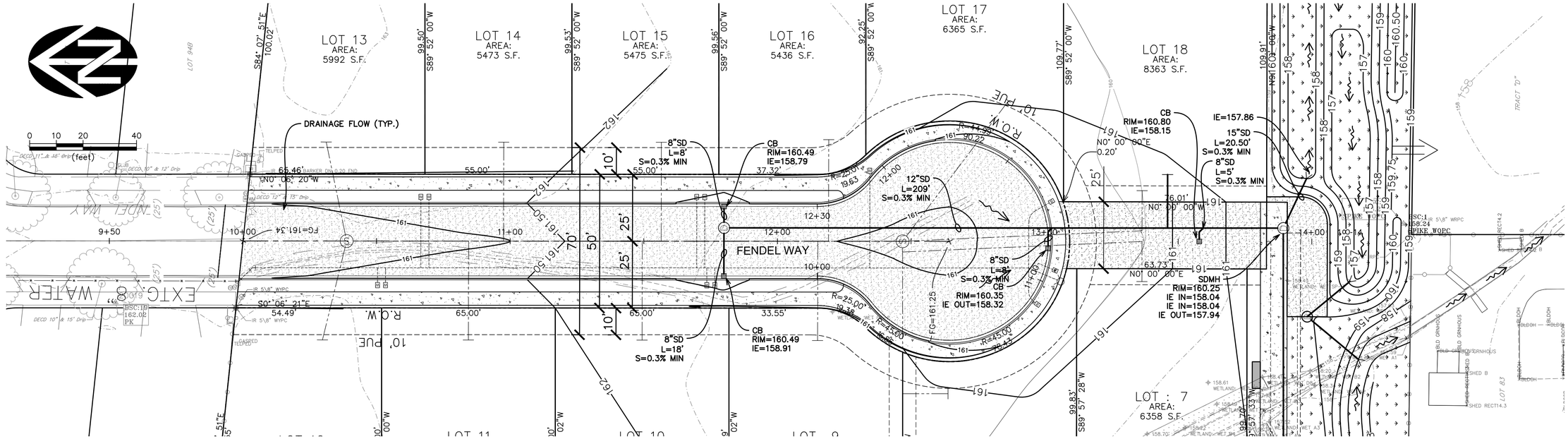
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

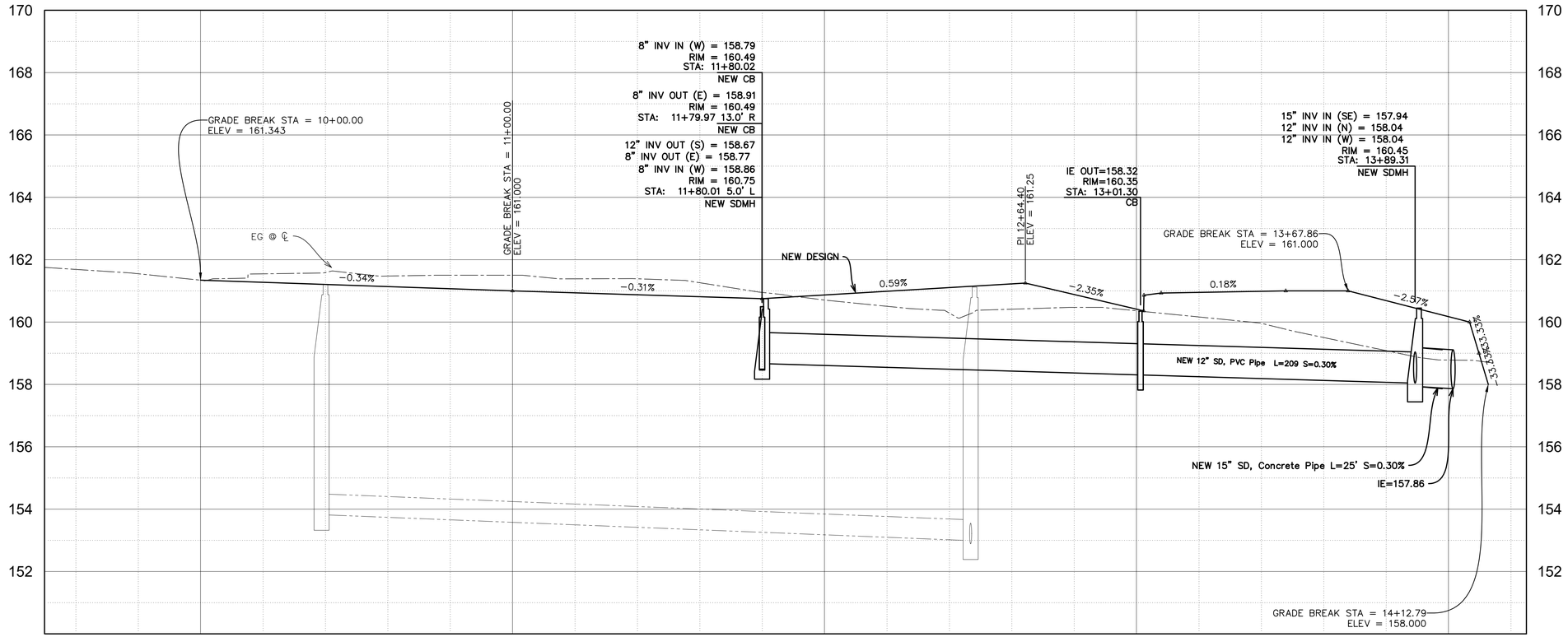
MEADOWS STREET PLAN AND PROFILE

DRAWING
ST-1

JOB NUMBER
2931.0000.0



NW MEADOWS DRIVE PLAN STA:10+00 - 14+14.40



NW MEADOWS DRIVE PROFILE STA:10+00-14+14.40

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

VERIFY SCALE
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0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 05/20/2022

REVIEW
REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 2007
WILLIAM J. WELLS

RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
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Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

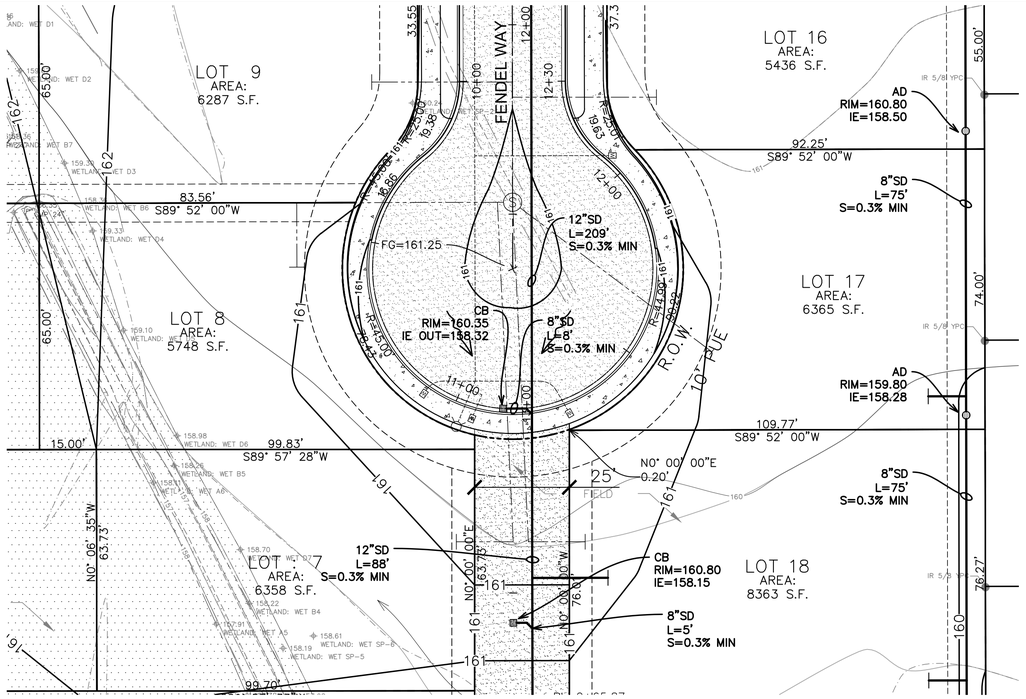
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

FENDEL WAY PLAN AND PROFILE

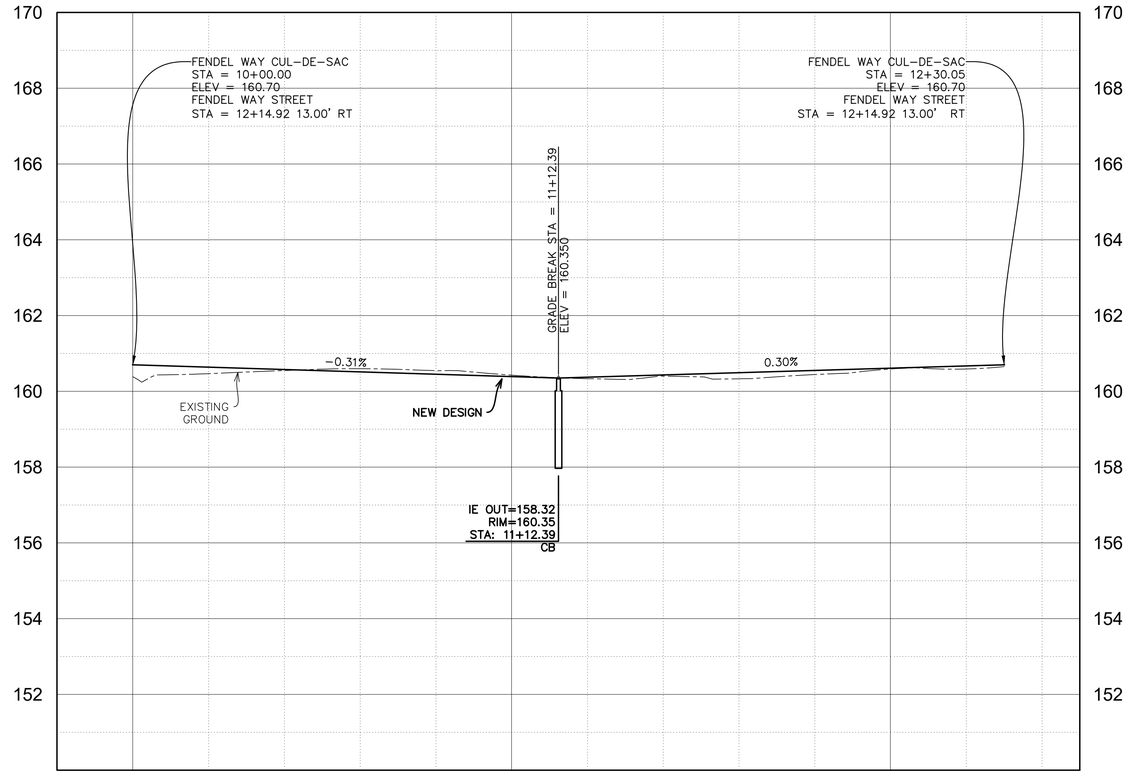
DRAWING
ST-2

JOB NUMBER
2931.0000.0

0 10 20 40
(feet)



FENDEL WAY PLAN STA:10+00 - 12+30.05



FENDEL WAY PROFILE STA:10+00 - 12+30.05

VERIFY SCALE
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NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

DSN.	JW
DRN.	IH
CKD.	JW
DATE:	05/20/2022

REVIEW
REGISTERED PROFESSIONAL ENGINEER
WILLIAM T. WELLS
EXPIRES: 12/31/2023
RENEWS: 6/30/2022

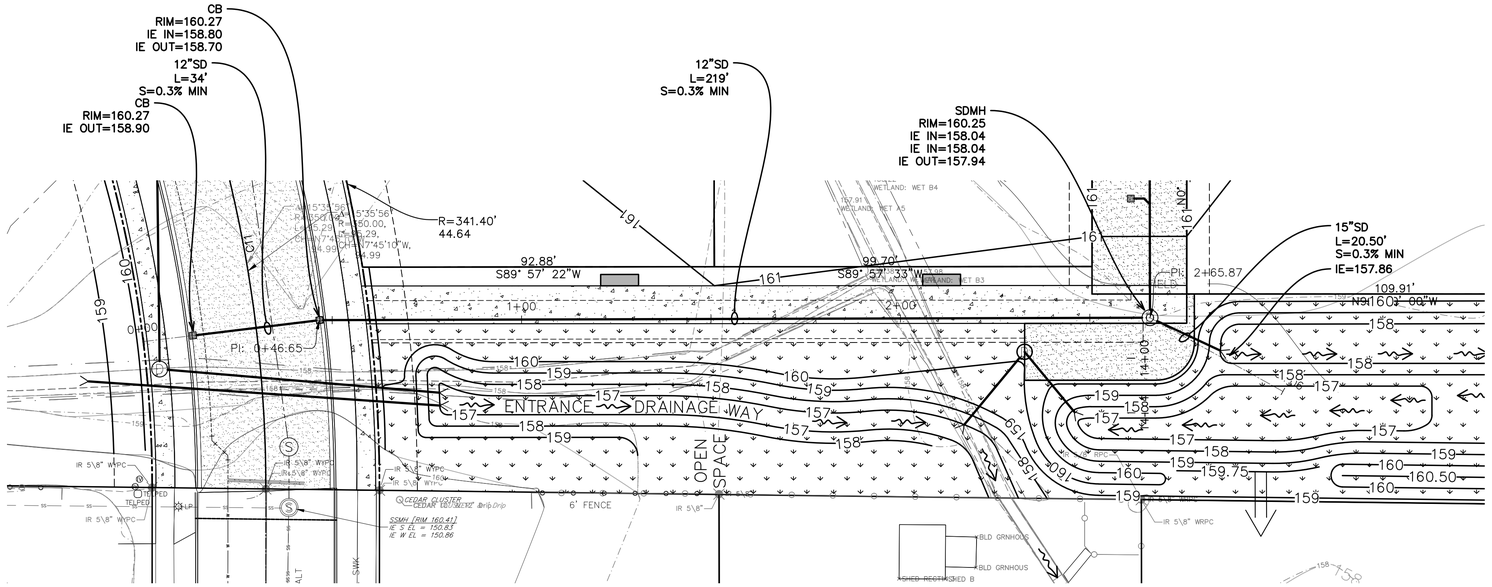
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

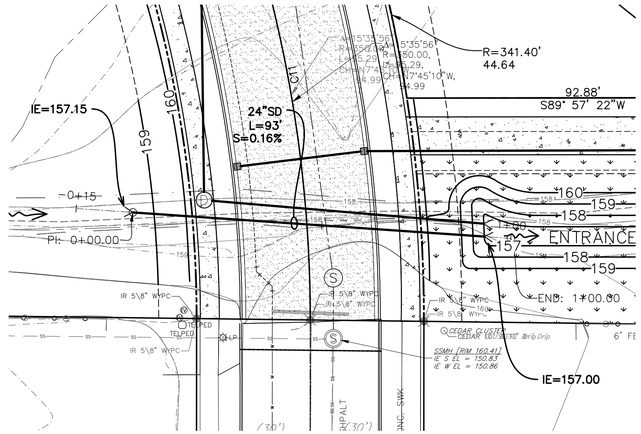
FENDEL WAY CUL-DE-SAC PLAN AND PROFILE

DRAWING
ST-3

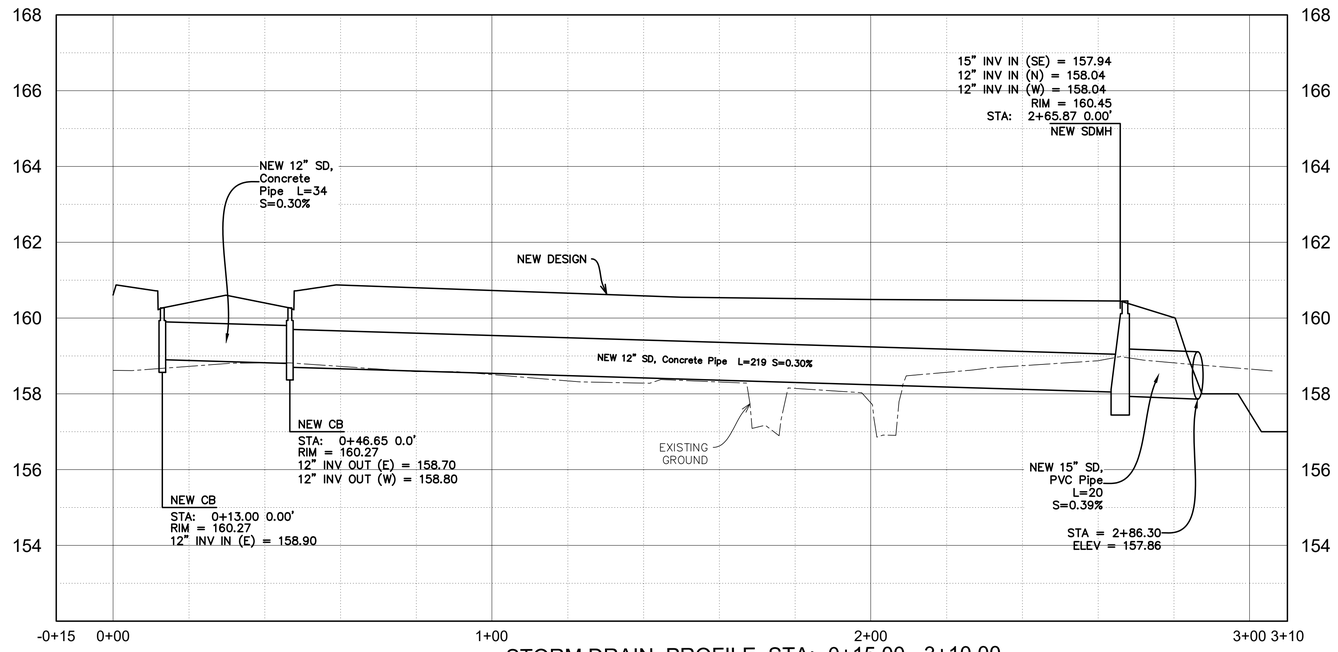
JOB NUMBER
2931.0000.0



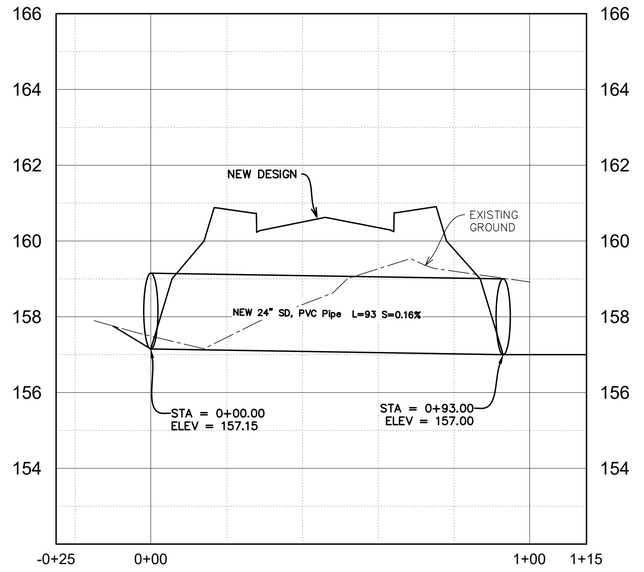
STORM DRAIN PROFILE STA: -0+15.00 - 3+10.00



STORM DRAIN PROFILE STA: -0+25.00 - 1+15.00



STORM DRAIN PROFILE STA: -0+15.00 - 3+10.00



STORM DRAIN PROFILE STA: -0+25.00 - 1+15.00

0 10 20 40
(feet)

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 05/20/2022

REVIEW REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 1976
WILLIAM T. WELLS
RENEWS: 6/30/2022

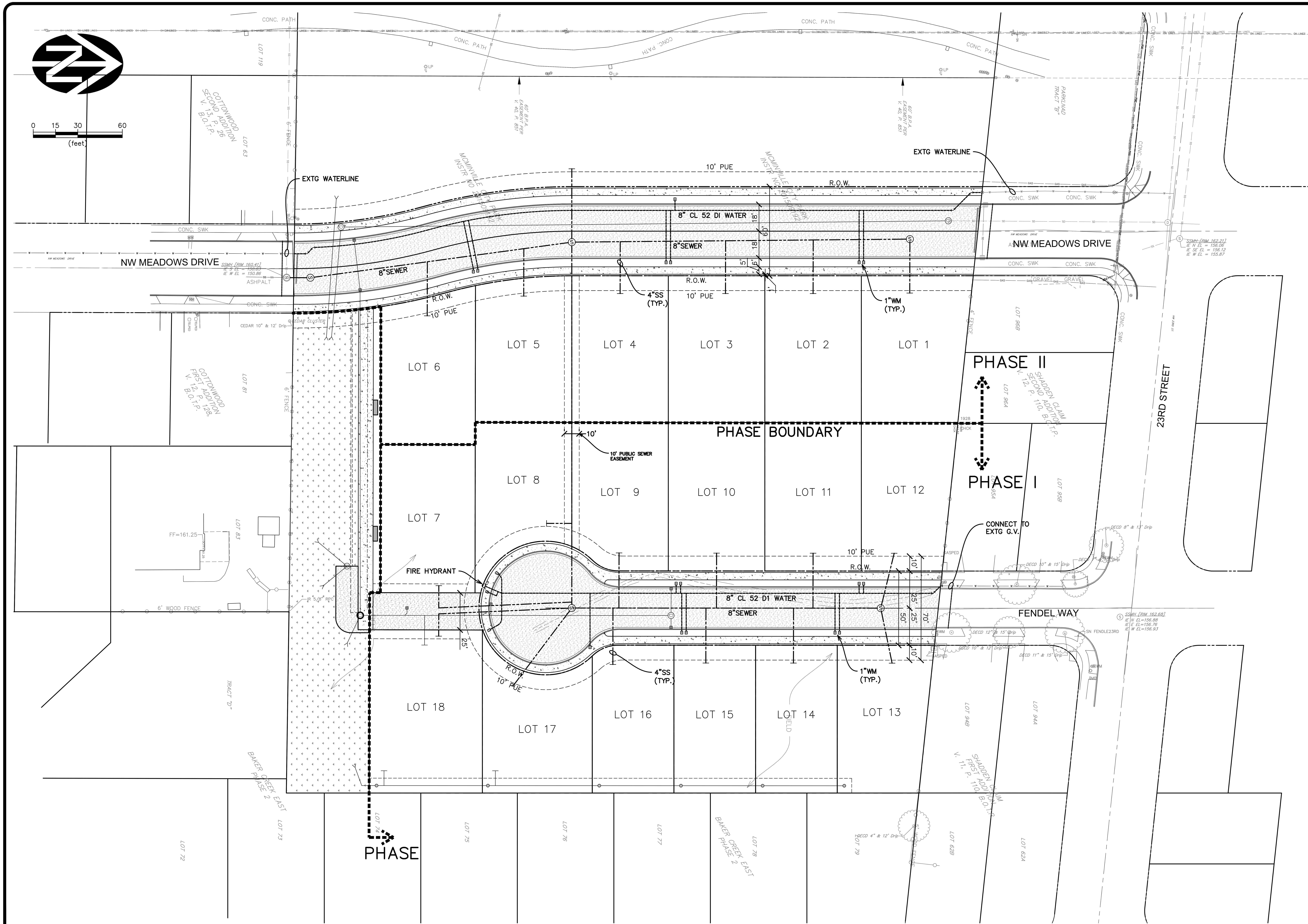
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E. Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

STORM DRAIN PLAN & PROFILE

DRAWING
ST-4

JOB NUMBER
2931.0000.0



VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

OVERALL UTILITY PLAN

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

REVIEW

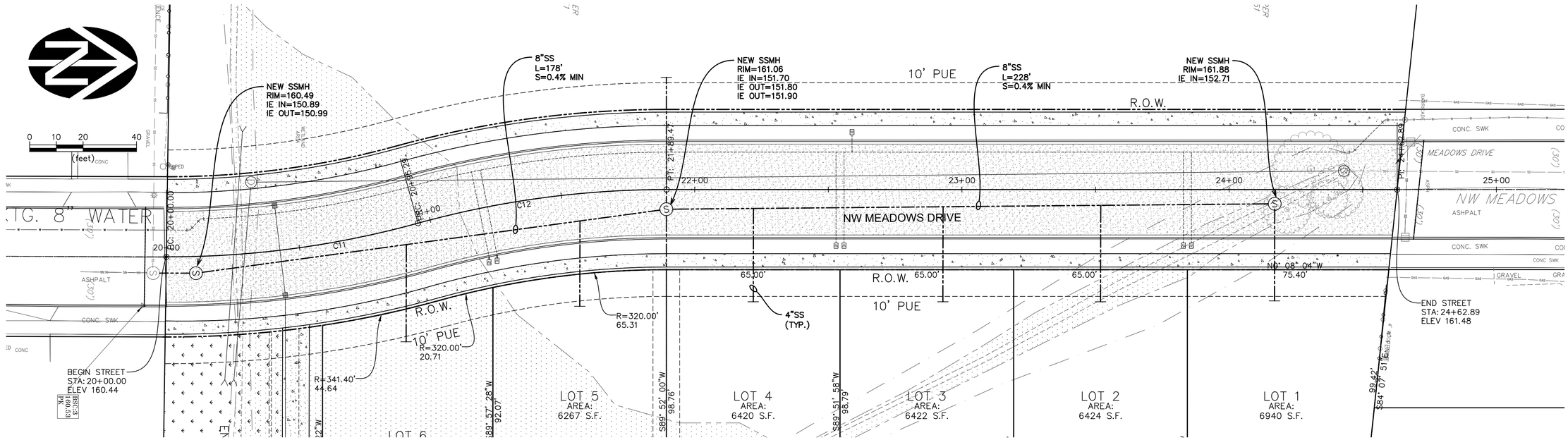
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DSN. JW
DRN. IH
CKD. JW

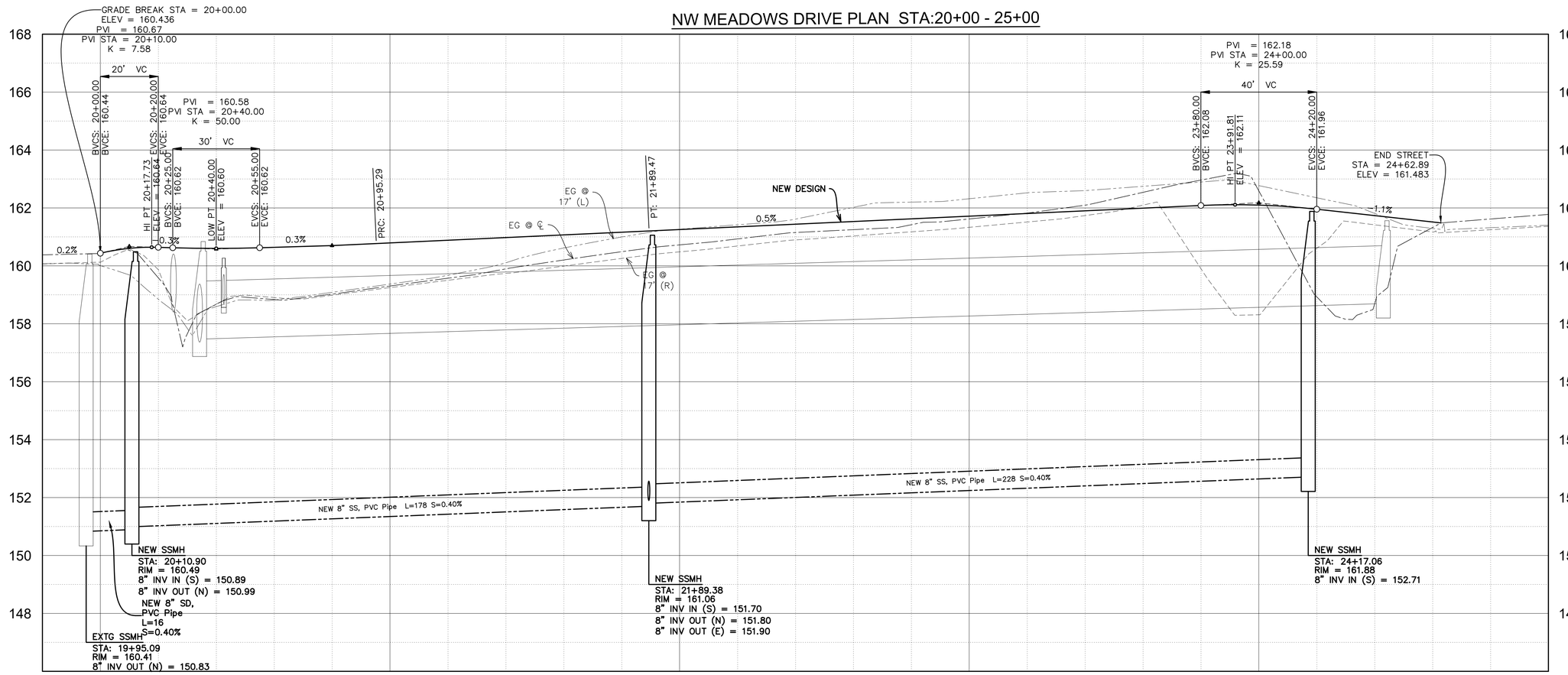
NO.	DATE	DESCRIPTION	BY
		REVISIONS	

DRAWING
C4.0

JOB NUMBER
2931.0000.0



NW MEADOWS DRIVE PLAN STA:20+00 - 25+00



NW MEADOWS DRIVE PROFILE STA:20+00-25+00

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

DSN. JW
DRN. IH
CKD. JW
DATE: 8/5/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 1976
WILLIAM T. WELLS
RENEWS: 6/30/2022

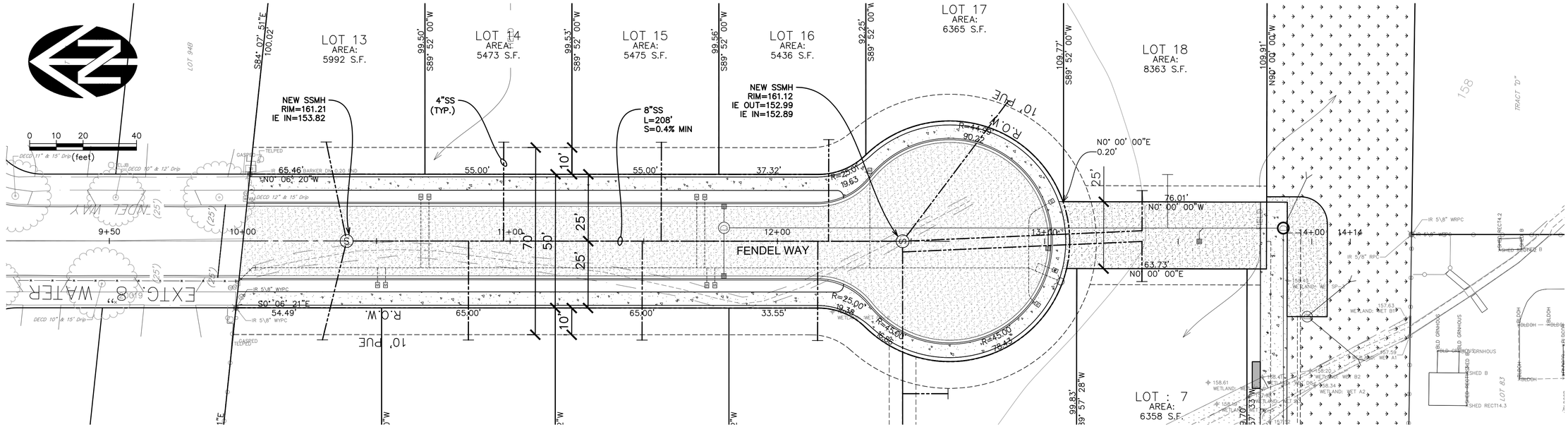
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

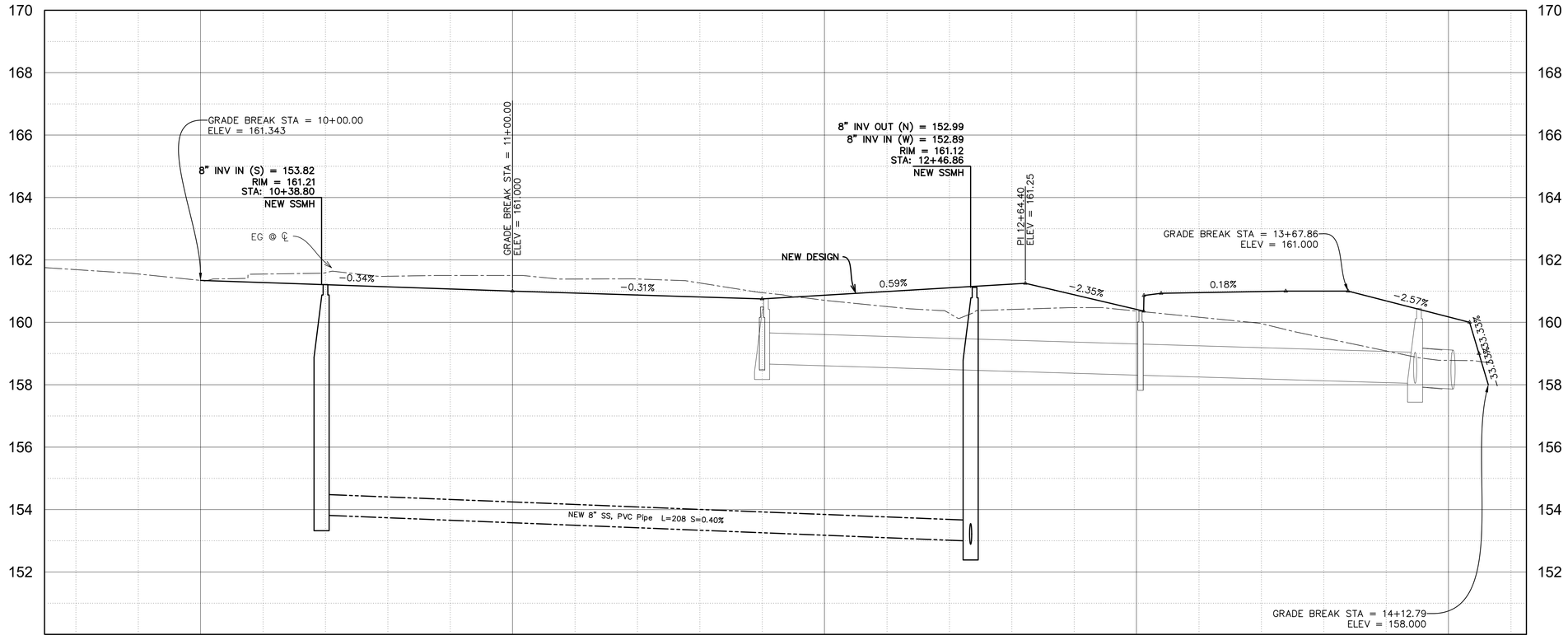
MEADOWS SANITARY SEWER PLAN AND PROFILE

DRAWING
SS-1

JOB NUMBER
2931.0000.0



FENDEL WAY PLAN STA:10+00 - 12+64.40



FENDEL WAY PROFILE H:1"=10' V:1"=1'

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH, ADJUST SCALES ACCORDINGLY
0 1"

DSN. JW
DRN. IH
CKD. JW
DATE: 10/5/2006

REVIEW REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 1978
WILLIAM T. WELLS

RENEWS: 6/30/2022

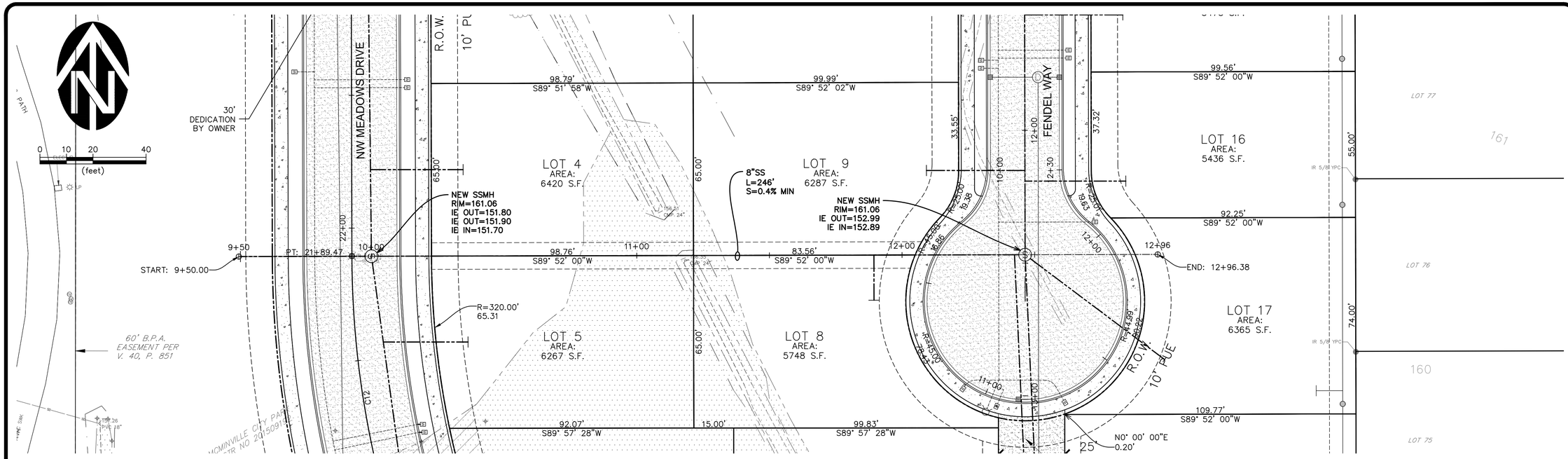
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

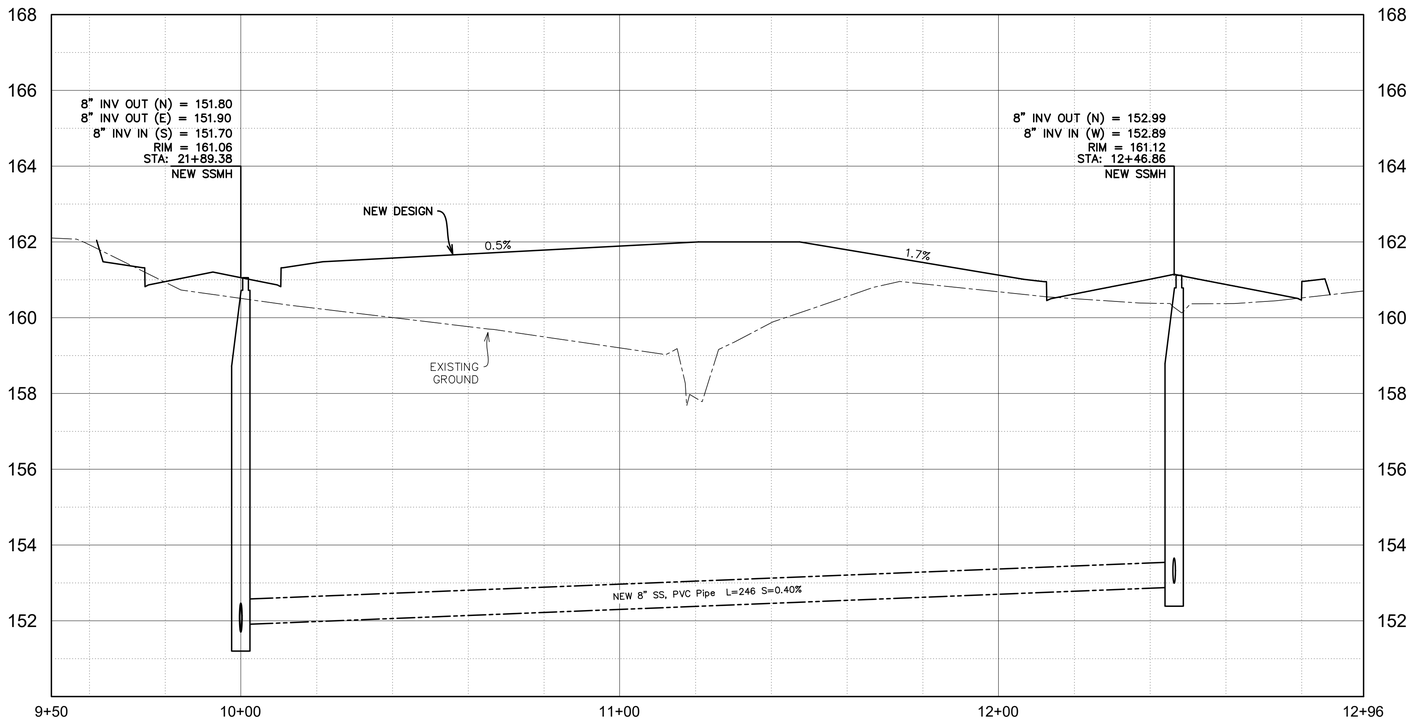
FENDEL WAY SANITARY SEWER PLAN AND PROFILE

DRAWING
SS-2

JOB NUMBER
2931.0000.0



SANITARY SEWER PLAN STA:10+00 - 12+46.38



SANITARY SEWER PROFILE H:1"=10' V:1"=1'

NO.	DATE	REVISIONS	BY
1			

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 07/22/2005

REVIEW

REGISTERED PROFESSIONAL ENGINEER
WILLIAM T. WELLS
12-27-1988
RENEWS: 6/30/2022

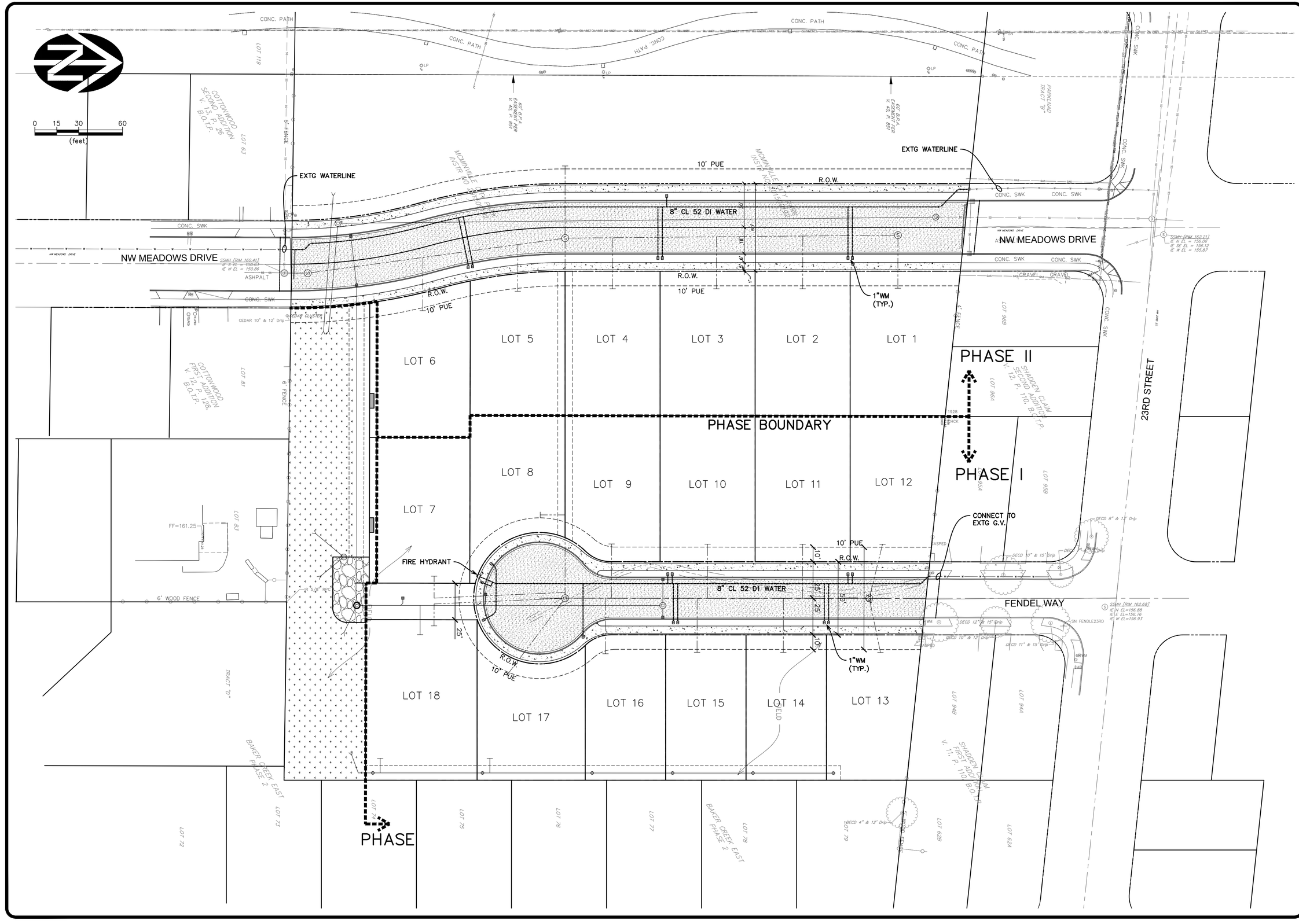
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

SANITARY SEWER MEADOWS DRIVE AND FENDEL WAY

DRAWING
SS-3

JOB NUMBER
2931.0000.0



VERIFY SCALE
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0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

DSN. JW
DRN. IH
CKD. JW
DATE: 05/20/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 1978
WILLIAM J. WELLS
RENEWS: 6/30/2022

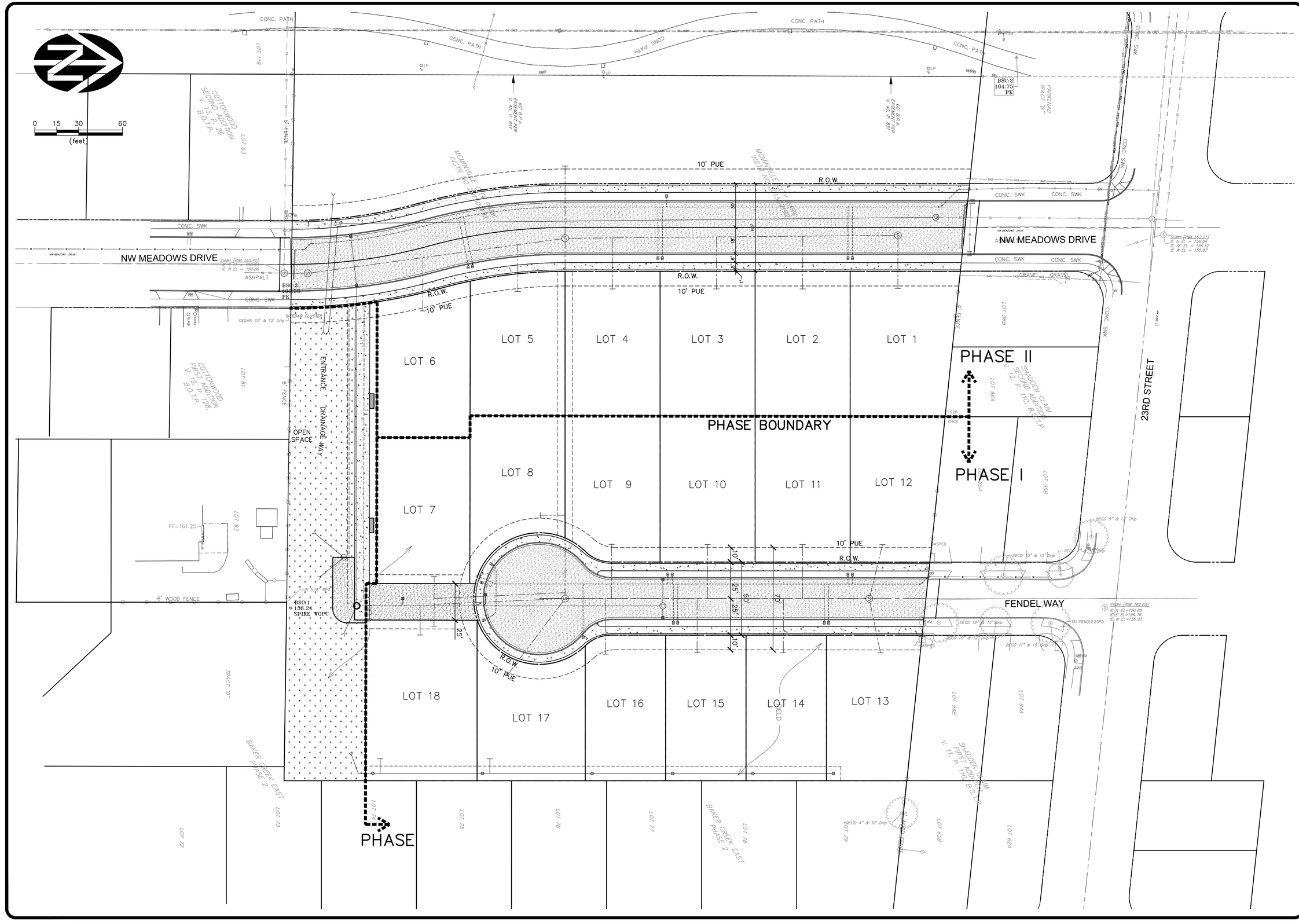
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

OVERALL WATER PLAN

DRAWING
W-1

JOB NUMBER
2931.0000.0



VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH, ADJUST SCALES ACCORDINGLY
0 1"

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

DSN. JW
DRN. IH
CKD. JW
DATE: 8/5/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 12, 2005
WILLIAM J. WELLS

RENEWS: 6/30/2022

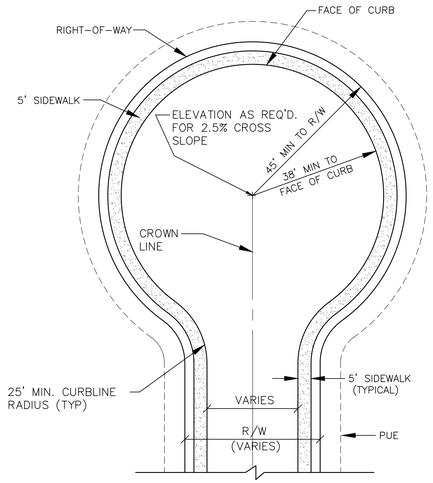
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

MW & L POWER PLAN

DRAWING
UT-1

JOB NUMBER
2931.0000.0



NOTES:

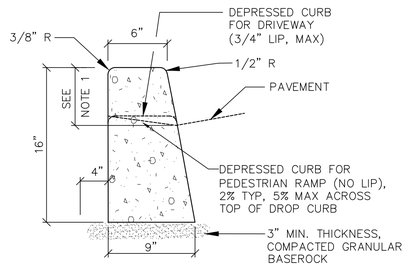
1. 2.5% MIN. CROSS SLOPE REQUIRED FROM CENTER OF BULB TO GUTTER.
2. MAINTAIN CROWN LINE TO CENTER OF CUL-DE-SAC BULB.

LAST REVISION DATE:	JO #
NOV 2013	STANDARD

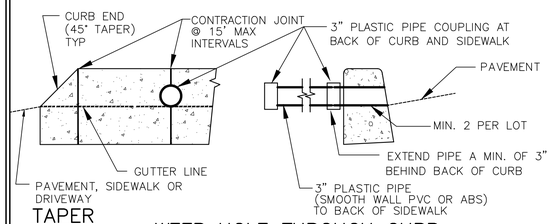
STANDARD CUL-DE-SAC

(NTS)

WESTECH ENG.	DETAIL NO. 2050



TYPE 'C' CURB



TAPER

WEEP HOLE THROUGH CURB

NOTES

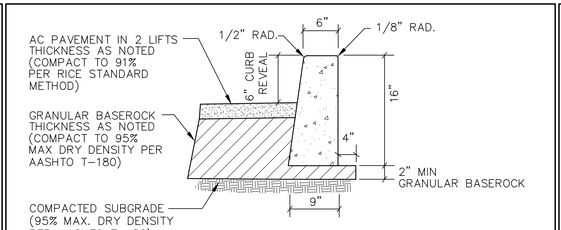
1. 7" CURB EXPOSURE FOR ARTERIAL & COLLECTOR STREETS TYPICAL WHERE TYPE C CURB IS ALLOWED.
   6" EXPOSURE ALL OTHER PUBLIC STREETS, PRIVATE STREETS & PARKING LOTS.
2. A CONTRACTION JOINT SHALL BE PLACED ACROSS SIDEWALK OVER WEEP HOLE PIPE.
3. ALL CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
4. WHERE SIDEWALKS ARE TO BE CONSTRUCTED, EXTEND 3" PIPE TO BACK OF SIDEWALK LOCATION & INSTALL COUPLING AT ALL WEEPHOLE LOCATIONS.
5. INSTALL MIN. 2 WEEP HOLES ON ALL LOTS. ONE TO BE AT LOW POINT OF LOT, 5' FROM P/L. WEEP HOLES IN EXISTING CURBS SHALL BE CORE DRILLED.
6. **UNLESS APPROVED IN WRITING BY AGENCY WITH JURISDICTION, MONOLITHIC CURB & PUBLIC SIDEWALK OR DRIVEWAY APRON PLACEMENT IS NOT PERMITTED (IE. CURB CONCRETE & SIDEWALK OR DRIVEWAY CONCRETE SHALL BE PLACED SEPARATELY).**

LAST REVISION DATE:	JO #
JULY 2017	STANDARD

STANDARD TYPE 'C' CURB

(NTS)

WESTECH ENG.	DETAIL NO. 2110



PAVEMENT & BASEROCK SECTIONS:

1. LIGHT DUTY PAVEMENT
   3" AC PAVEMENT IN 2 LIFTS (1" CLASS 'C' OVER 2" CLASS 'B')
   7" OF 1"-0 GRANULAR BASEROCK
2. HEAVY DUTY PAVEMENT
   3" AC PAVEMENT IN 2 LIFTS (1" CLASS 'C' OVER 2" CLASS 'B')
   12" OF 1"-0 GRANULAR BASEROCK

PAVEMENT/TYPE "C" CURB DETAIL

NTS

NOTES:

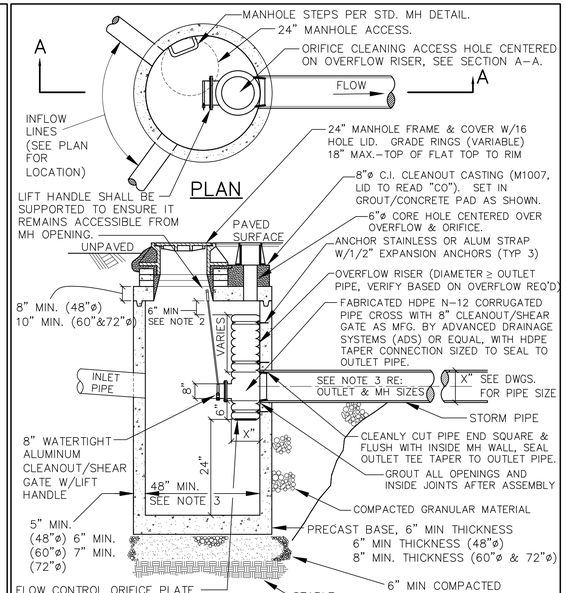
1. SEE GRADING PLAN FOR LOCATION OF LIGHT AND HEAVY DUTY PAVEMENT.
2. DESIGN SUBGRADES SHALL BE COMPACTED AND PROOF-ROLLED PRIOR TO PLACEMENT OF BASEROCK. IF SUBGRADE PASSES PROOF-ROLL BUT FAILS DENSITY TESTING, MIN. 4.5 OZ NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED ON SUBGRADE PRIOR TO PLACEMENT OF BASEROCK. FAILURE OF PROOF-ROLL WILL REQUIRE OVEREXCAVATION.
3. IF SUBGRADE FAILS THE PROOF-ROLL, SUBGRADE SHALL BE OVEREXCAVATED TO UNDISTURBED SOIL AND BACKFILLED WITH BASEROCK OVER MIN. 8.0-OZ. NON-WOVEN FABRIC AS REQUIRED TO ALLOW COMPACTION OF UPPER (DESIGN) BASEROCK SECTION AND TO MAINTAIN STRUCTURAL INTEGRITY OF NATIVE SUBGRADE SOILS. TYPICAL MIN. OVEREXCAVATION REQUIRED IS 12-INCHES. NO RUBBER TIRED EQUIPMENT ALLOWED ON SUBGRADE FOLLOWING OVEREXCAVATION.
4. SUBGRADE TO BE PROOFROLLED IMMEDIATELY PRIOR TO PLACING BASEROCK. BASEROCK TO BE PROOFROLLED IMMEDIATELY PRIOR TO PAVING.
5. CONTRACTION JOINTS SHALL BE PLACED AT 15' MIN. INTERVALS AND SHALL EXTEND AT LEAST 50% THROUGH THE CURB SECTION.
6. ALL CONCRETE SHALL BE 3300 PSI @ 28 DAYS.
7. CURBS TO CURE A MINIMUM OF 7 DAYS PRIOR TO PLACING FINAL BASEROCK AND PAVING. USE TYPE 1 OR 1-D CLEAR CURING COMPOUND.

LAST REVISION DATE:	JO #
DEC 1999	X

PAVEMENT AND TYPE 'C' CURB DETAIL

(NTS)

WESTECH ENG.	DETAIL NO. 2390



SECTION A-A

NOTES:

1. PRECAST SECTIONS SHALL CONFORM TO ASTM C-478.
2. DISTANCE FROM TOP OF OVERFLOW TO MH RIM SHALL BE BASED ON OVERFLOW CAPACITY CALC'S BY DESIGN ENGINEER (ASSUME ORIFICE CONTROL).
3. 60" MINIMUM DIA. MANHOLE REQUIRED FOR OUTLET PIPE LARGER THAN 15" OR INLET > 21".
4. ORIFICE CLEANING ACCESS TO BE 6" CORE HOLE THROUGH FLAT-TOP (CENTERED ON OVERFLOW) WITH CI CLEANOUT BOX GROUTED TO SLAB.

LAST REVISION DATE:	
AUG 2014	STANDARD

POLLUTION/FLOW CONTROL MANHOLE W/OVERFLOW

(NTS)

WESTECH ENG.	DETAIL NO. 3200

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 8/5/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 2010 WILLIAM T. WELLS

RENEWS: 6/30/2022

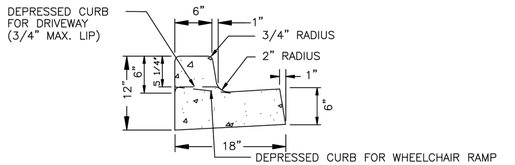
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

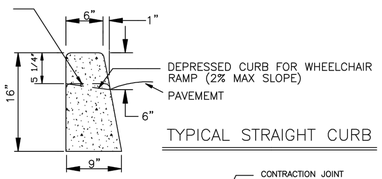
DETAILS

DRAWING
C6.0

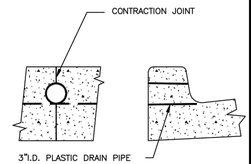
JOB NUMBER
2931.0000.0



TYPICAL CURB & GUTTER



TYPICAL STRAIGHT CURB



WEEP HOLE THROUGH CURB

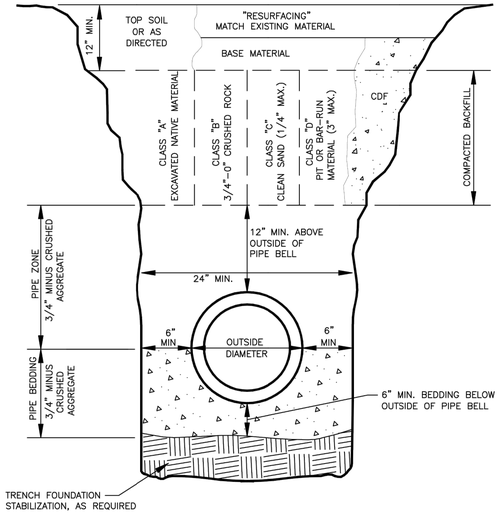
NOTES:

1. ALL RADII SHALL BE 3/4" EXCEPT AS OTHER-WISE SHOWN.
2. ISOLATION JOINTS SHALL BE PLACED ONLY AS SPECIFIED.
3. CONTRACTION JOINTS SHALL BE PLACED AT 15' INTERVALS UNLESS OTHERWISE SPECIFIED, AND SHALL EXTEND AT LEAST 50% THROUGH THE CURB OR CURB & GUTTER.
4. A CONTRACTION JOINT SHALL BE PLACED ALONG AND OVER WEEP HOLE THROUGH THE CURB AND THROUGH THE SIDEWALK.
5. WHEN SIDEWALKS ARE CONSTRUCTED, EXTEND 3" PIPE TO BACK OF SIDEWALK AND INSTALL COUPLING.

City of McMinnville

DETAIL FOR
P.C. CONCRETE
CURB AND GUTTER

DATE: AUGUST 2009 | DRAWING NO. 6

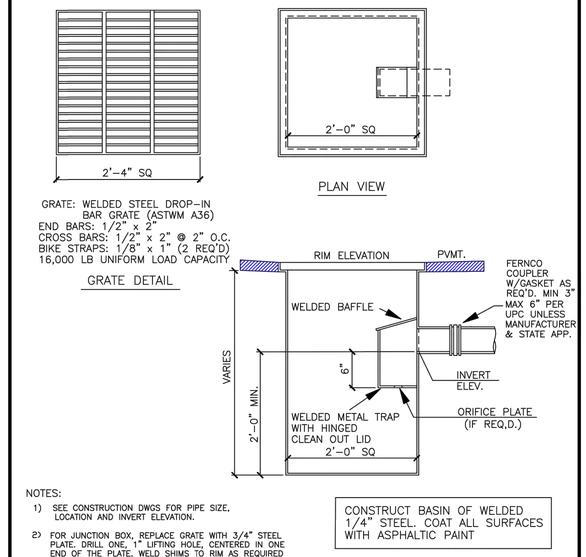


NOTE:
SURFACING OF PAVED AREAS SHALL COMPLY WITH STREET CUT STANDARD DWG. NO. 8.

City of McMinnville

DETAIL FOR
TRENCH BACKFILL
BEDDING & PIPE ZONE

DATE: AUGUST 2009 | DRAWING NO. 9



NOTES:

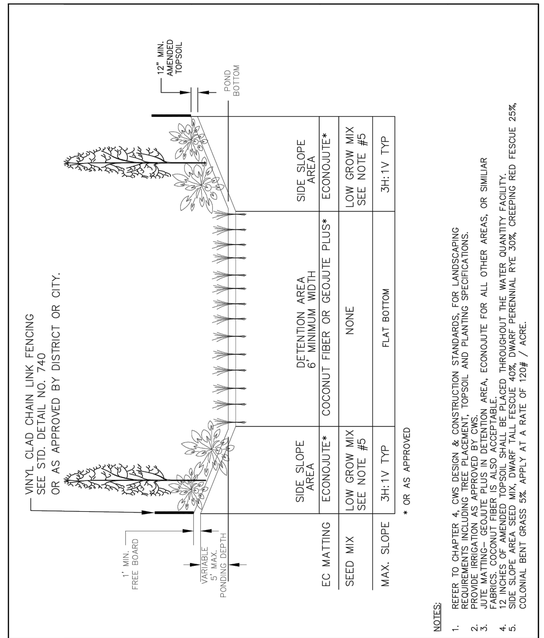
1) SEE CONSTRUCTION DWGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2) FOR JUNCTION BOX, REPLACE GRATE WITH 3/4" STEEL PLATE, DRILL ONE, 1" LIFTING HOLE, CENTERED IN ONE END OF THE PLATE. WELD SHIMS TO RIM AS REQUIRED TO RAISE PLATE TO RIM ELEVATION.
3) OUTLET: SIZE AS REQ'D. FOR INDICATED PIPE SIZE.

CONSTRUCT BASIN OF WELDED 1/4" STEEL. COAT ALL SURFACES WITH ASPHALTIC PAINT

City of McMinnville

DETAIL FOR
PARKING LOT CATCH BASIN
(LYNCH STYLE)

DATE: AUGUST 2009 | DRAWING NO. 27



NOTES:

1. REFER TO CHAPTER 4, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS. PROVIDE IRRIGATION AS APPROVED BY CWS.
2. JUTE MATTING: GEOJUTE PLUS IN DETENTION AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
3. 12 INCHES OF AMENDED TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUANTITY FACILITY.
4. SIDE SLOPE AREA SEED MIX, DWARF TALL FESCUE 40% DWARF PERENNIAL RYE 30%, CREEPING RED FESCUE 25%.
5. COLONIAL BENT GRASS 5%. APPLY AT A RATE OF 120# / ACRE.

DETENTION POND

DRAWING NO. 700 | REVISED 10-31-19

CleanWater Services

CONSTRUCTION

1. Detention Pond shall be over-excavated and filled to final grade with 12-inch amended topsoil. Topsoil amendments shall be garden compost, not conventional fertilizer amendments.
2. A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the Detention Pond cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Anchor spacing shall be based on 3 fps flow over the fabric.
   a. Pond bottom - high-density jute matting (Geojute Plus or other approved equal)
   b. All other areas - low-density jute matting (Econojute or other approved equal)
3. Plant materials shall be placed in accordance with the plan and plant table as shown on approved plans.
4. The facility shall be deemed acceptable to begin the maintenance period when plant growth and density matches the Engineer's design as shown on the approved plans and all other requirements have been met. The Engineer must certify the facility to be functional, in accordance with the approved plan design to begin the two-year maintenance period..

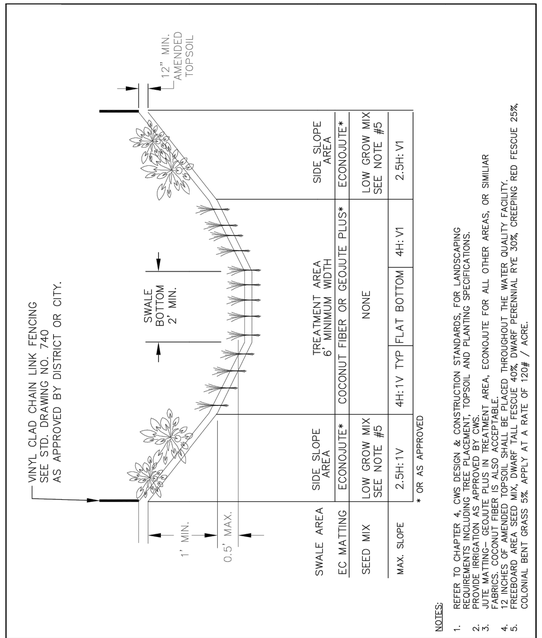
MAINTENANCE

1. The permittee is responsible for the maintenance of this facility for a minimum of two years following construction and acceptance of this facility per Chapter 2.
2. Irrigation is to be provided per separate irrigation plan as approved.
   Note: Irrigation needs are to be met using a temporary irrigation system with a timer during the dry season. Systems should be winterized during the wet season to assure longevity and guard against damage from freezing temperatures. Water source shall be as shown on the approved plans.
3. Engineer or Owner's Representative is required to perform Monitoring and Maintenance of the Site and provide Documentation as required in Appendix A, 2.5 of the Design and Construction Standards. The Approved Plans shall include a Maintenance Schedule per Appendix A, 2.6.e of the Design and Construction Standards.
4. The Facility shall be re-excavated and planted if siltation greater than 3 inches in depth occurs within the two-year maintenance period.

DETENTION POND
CONSTRUCTION & MAINTENANCE NOTES

DETAIL NO. 701 | REVISED 10-31-19

CleanWater Services



NOTES:

1. REFER TO CHAPTER 4, CWS DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS. PROVIDE IRRIGATION AS APPROVED BY CWS.
2. JUTE MATTING: GEOJUTE PLUS IN TREATMENT AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
3. 12 INCHES OF AMENDED TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUALITY FACILITY.
4. SIDE SLOPE AREA SEED MIX, DWARF TALL FESCUE 40% DWARF PERENNIAL RYE 30%, CREEPING RED FESCUE 25%.
5. COLONIAL BENT GRASS 5%. APPLY AT A RATE OF 120# / ACRE.

WATER QUALITY SWALE

DRAWING NO. 705 | REVISED 10-31-19

CleanWater Services

CONSTRUCTION

1. Water Quality Facility shall be over-excavated and filled to final grade with 12-inch amended topsoil. Topsoil amendments shall be garden compost, not conventional fertilizer amendments.
2. A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the swale cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Anchor spacing shall be based on 3 fps flow over the fabric.
   a. Treatment area - high-density jute matting (Geojute Plus or other approved equal)
   b. All other areas - low-density jute matting (Econojute or other approved equal)
3. Plant materials shall be placed in accordance with the plan and plant table as shown on approved plans.
4. The water quality facility treatment area plantings can be deemed "substantially complete" once active green growth has occurred to an average growth of 3" and plant density is an average of approx. 6 plants (minimum 1-inch plugs or equivalent) per square foot.
5. The facility shall be deemed acceptable to begin the maintenance period when plant growth and density matches the engineer's design as shown on the approved plans and all other requirements have been met. The engineer must certify the facility to be functional, in accordance with the approved plan design to begin the two-year maintenance period.

MAINTENANCE

5. The permittee is responsible for the maintenance of this facility for a minimum of two years following construction and acceptance of this facility per Chapter 2.
6. Irrigation is to be provided per separate irrigation plan as approved.
   Note: Irrigation needs are to be met using a temporary irrigation system with a timer during the dry season. Systems should be winterized during the wet season to assure longevity and guard against damage from freezing temperatures. Water source shall be as shown on the approved plans.
7. Engineer or Owner's Representative is required to perform Monitoring and Maintenance of the Site and provide Documentation as required in Appendix A, 2.5 of the Design and Construction Standards. The Approved Plans shall include a Maintenance Schedule per Appendix A, 2.6.e of the Design and Construction Standards.
8. The facility shall be re-excavated and planted if siltation greater than 3 inches in depth occurs within the two-year maintenance period.

WATER QUALITY SWALE
CONSTRUCTION & MAINTENANCE NOTES

DETAIL NO. 706 | REVISED 10-31-19

CleanWater Services

BY	DESCRIPTION	NO.	DATE
	REVISIONS	1	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 05/20/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 1976
WILLIAM T. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT

ELYSIAN SUBDIVISION

DETAILS

DRAWING
C6.1

JOB NUMBER
2931.0000.0

City of McMinnville
PLANNING

Planning Department
231 NE Fifth Street
McMinnville, OR 97128
(503) 434-7311

www.mcminnvilleoregon.gov

DECISION, CONDITIONS, FINDINGS OF FACT AND CONCLUSIONARY FINDINGS FOR THE APPROVAL OF A ZONE CHANGE FROM R-1 TO R-3, PLANNED DEVELOPMENT OVERLAY, AND 18 LOT SUBDIVISION, KNOWN AS THE ELYSIAN SUBDIVISION.

DOCKET:	ZC 1-22 (Zone Change), PD 1-21 (Planned Development), S 1-21 (Subdivision)
REQUEST:	Application for a zone change from R-1 to R-3, planned development overlay, and 18-lot subdivision.
LOCATION:	The subject site is 3.79 acres, located generally east of Meadows Drive and south of 23rd Street and Fendle Way (R4418 00204)
ZONING:	R-1
APPLICANT:	Don Jones, VJ-2 Development, Inc
STAFF:	Monica Bilodeau, Senior Planner
DATE DEEMED COMPLETE:	February 25, 2022
HEARINGS BODY & ACTION:	The McMinnville Planning Commission makes a recommendation to the City Council, and the City Council makes the final decision, per MMC 17.72.070
HEARING DATE & LOCATION:	April 21, 2022, Civic Hall, 200 NE 2nd Street, McMinnville, Oregon. Continued to May 19, 2022.
PROCEDURE:	The application is processed in accordance with the procedures in Section 17.72.120 of the Zoning Ordinance. The application is reviewed by the Planning Commission in accordance with the quasi-judicial public hearing procedures specified in Section 17.72.130 of the Zoning Ordinance.
CRITERIA:	The applicable criteria for a Zone Change, Planned Development, and Subdivision are specified in McMinnville's Municipal Code (MMC), Chapter 17.51, 17.53 and Section 17.74.020.
APPEAL:	As specified in MMC 17.72.130, a Planning Commission recommendation of approval of the application (or approval of the application in a different form) is transmitted to the City Council to make a final decision. However, a Planning Commission recommendation of denial is a final decision unless the decision is appealed to the City Council. Such an appeal must be filed within 15 calendar

Attachments:
Attachment 1 - Application
Attachment 2 - Approved Plans
Attachment 3 - Agency Comments

days of the date the written notice of decision is mailed. The City Council's final decision may be appealed to the Oregon Land Use Board of Appeals as specified in State Statute. The City's final decision is subject to the 120 day processing timeline, including resolution of any local appeal.

COMMENTS: This matter was referred to the following public agencies for comment: McMinnville Fire Department, Police Department, Engineering Department, Building Department, Parks Department, City Manager, and City Attorney; McMinnville Water and Light; McMinnville School District No. 40; Yamhill County Public Works; Yamhill County Planning Department; Frontier Communications; Comcast; and Northwest Natural Gas. Comments were received from the McMinnville Engineering Department and Oregon Department of State Lands. Their comments are provided in this document.

DECISION

Based on the findings and conclusionary findings, the Planning Commission finds the applicable criteria are satisfied and **RECOMMENDS APPROVAL** of the Zone Change from R-1 to R-3, Planned Development overlay, and 18-lot Subdivision.

//

RECOMMENDATION: APPROVAL

//

Planning Commission:_____ Date:_____
Sidonie Winfield, Chair of the McMinnville Planning Commission

Planning Department: _____ Date:_____
Heather Richards, Planning Director

Attachments:
Attachment 1 - Application
Attachment 2 - Approved Plans
Attachment 3 - Agency Comments

SECTION I. APPLICATION SUMMARY:

Subject Property & Request

The proposal is an application for a Zone Change (ZC 1-22) to rezone the property from R-1 to R-3, Planned Development (PD 1-21), and phased 18-lot subdivision (S 1-21) for the property. The zone change will allow the lot size to be reduced from 9,000 square feet to 6,000 square feet. The planned development overlay would allow for the side setbacks to be reduced from seven and a half feet to five feet, all other setbacks would conform to the R-3 standards.

The subject property is a 3.79 acre parcel located generally east of Meadows Drive and south of 23rd Street and Fendle Way. The proposed subdivision will extend Meadows drive, creating a finished through street, and Fendle Way is proposed to be continued into the subdivision and terminated with a cul-de-sac. There is also a 16,925 SF open space tract along the southern property line which will contain stormwater facility and adjacent will be a 20 foot wide pedestrian access easement and 10 foot wide paved connection from Fendle to Meadows Drive**. *See Exhibit 1 and 3.***

The subject property and properties to the north, east, and west, are zoned R-1, and property to the south is zoned R-2. Although the actual sizes of adjacent lots in the R-1 zone range from 4,600 to 6,400 square feet. The average lots proposed in this subdivision range between 5,436 at the smallest and 8,363 square feet at the largest. The proposed lot sizes are similar to the adjacent lots. ***See Exhibit 2.*** The predominant surrounding uses are single-family homes and duplexes to the north, single-family homes to the east and south, and Jay Pearson Neighborhood Park to the west. The subject property is currently vacant with a natural drainageway generally running north to south on the property.
Most lots would access off the proposed extension of Fendle Way, and six of the lots would access directly off of Meadows Drive

Exhibit 1. Vicinity Map & Aerial Photo

Attachments:
Attachment 1 - Application
Attachment 2 - Approved Plans
Attachment 3 - Agency Comments

Exhibit 2. Current and proposed Zoning

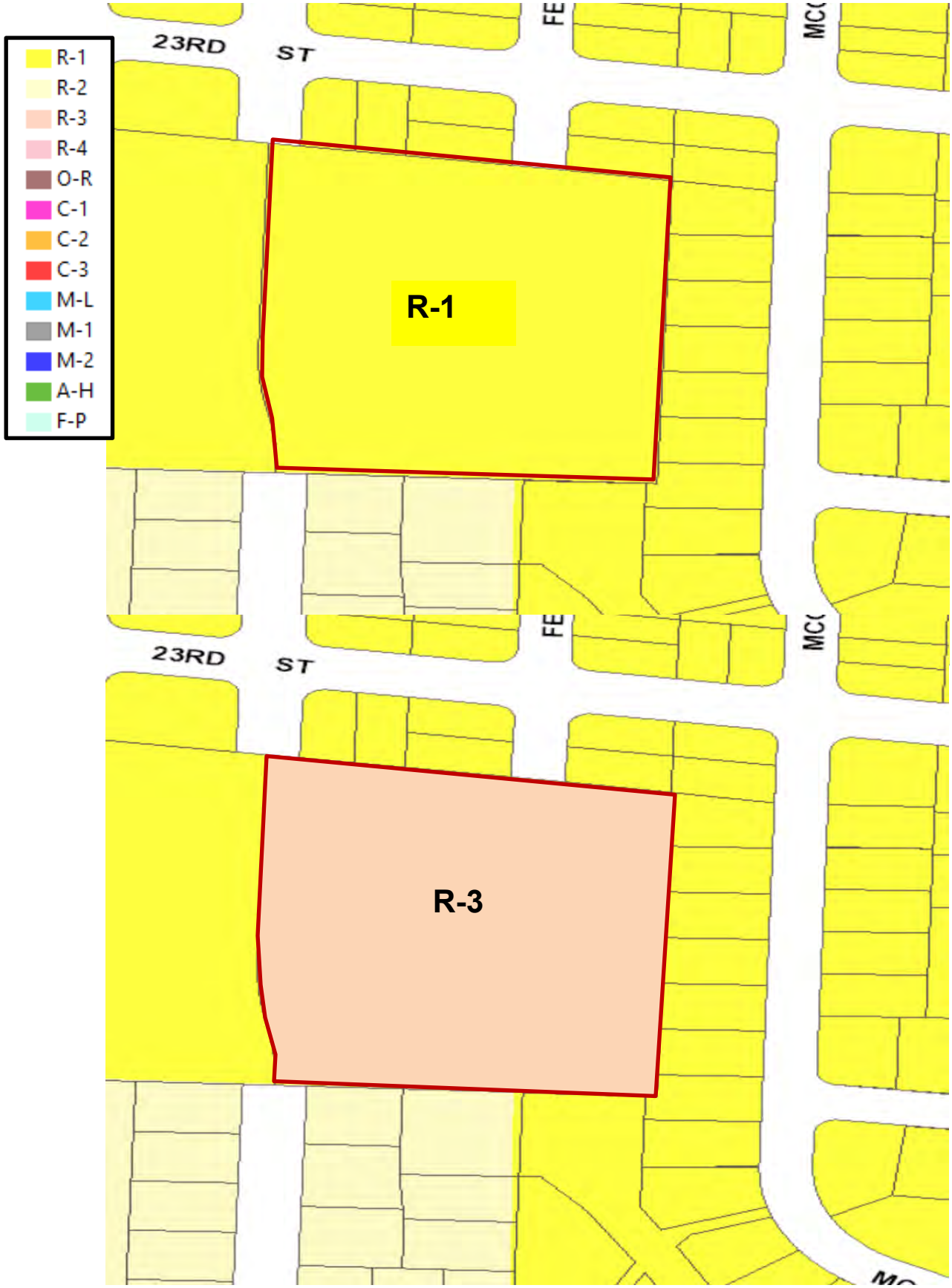


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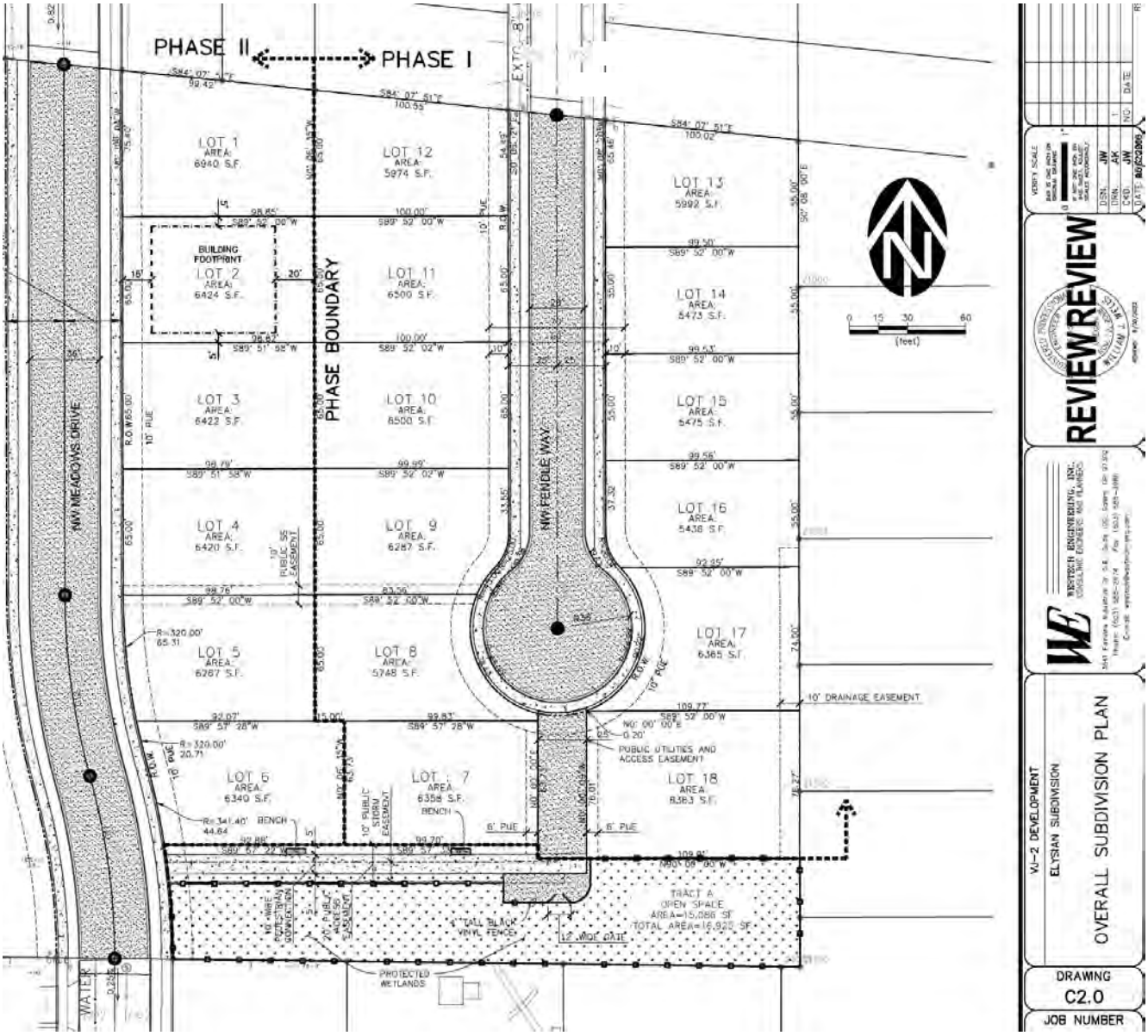
Exhibit 3. Proposed Subdivision Tentative Plan



SECTION II. CONDITIONS:

The zone change and planned development will become effective 30 days after City Council passes the associated ordinance. The subdivision approval shall expire 12 months from the date the final decision document is signed. Phase Two shall expire five (5) years from the date of this approval. Prior to expiration of the approval, the applicant shall comply with the conditions, execute a Construction Permit Agreement, and commence construction, complete construction, or provide required security, and submit the final plat. Upon written request, the Planning Director may approve a one-year extension of the decision. Additional extensions shall require the subdivider to resubmit the tentative plan to the Planning Commission and make any revisions considered necessary to meet changed conditions.

If the property owner wishes a one-year extension of the Commission approval of this tentative plan under the provisions of MMC Section 17.53.075 (Submission of Final Subdivision Plat), a request for

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such extension must be filed in writing with the Planning Department a minimum of 30 days prior to the expiration date of this approval.

Planned Development Overlay Requirements

1. The Elysian Subdivision plan shall be placed on file with the Planning Department and become a part of this planned development zone and binding on the developer. The developer will be responsible for requesting approval of the Planning Commission for any major change in the details of the adopted site plan. Minor changes to the details of the adopted plan may be approved by the Planning Director. It shall be the Planning Director's decision as to what constitutes a major or minor change. An appeal from a ruling by the Planning Director may be made only to the Planning Commission. Review of the Planning Director's decision by the Planning Commission may be initiated at the request of any one of the Commissioners.

2. The following standards shall be recorded with the planned development overlay.

Planned Development Overlay	Proposed Standards
Average Lot Size	6,000 sf
Minimum Lot Width	50 ft.
Minimum Setbacks	
- Front	15 ft.
- Street side	15 ft.
- Side	5 ft.
- Rear	20 ft.
- Garage	20 ft.
Maximum Height	35 ft.
Maximum Lot Coverage	80%
Minimum Landscape Area	20%

3. The majority of delineated wetland be preserved, and a minimum of two (2) wetland viewing areas that are accessible with seating be provided adjacent to the wetlands adjacent to the common open space Tract A. The developer and the Homeowner's Association shall enter into a Revocable License Agreement with the City to establish and maintain wetland viewing areas in the public access easement that are accessible, meet city specifications and are maintained by the developer and Homeowner's Association.

4. The City of McMinnville shall require evidence of compliance with all applicable local, state, and federal standards and regulations for wetland mitigation.

5. The following p~~P~~ublic amenities shall be included in the 20 foot public access easement connecting Fendle Way to Meadows Drive as approved by the Planning Director.:

   a. ~~such as~~ T~~t~~wo benches as shown, or other public amenities such as art or stormwater and wetland educational components, ~~as approved by the Planning Director~~

   b. Split rail open black fencing or other fencing style aesthetically pleasing ~~shall be included in the 20 foot public access easement connecting Fendle Way to Meadows Drive.~~

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c. Any exposed irrigation lines shall be black or camouflaged from the public view.

d. Walkway lighting shielded down as not to impact adjacent residents.

6. A direct Pedestrian connection to the Jay Pearson Park and the trail corridor is required. This connection shall connect Meadows Drive west to the existing trail corridor along the projects frontage. Approval by the Directors of Planning and Parks and Recreation is required prior to construction.

Subdivision Conditions

PRIOR TO COMMENCING SITE IMPROVEMENTS

~~1.~~7. The Applicant must submit plans showing the following required street improvements to Engineering for review and approval:

NW Meadows Drive (Minor Collector)
- 60' right-of-way dedication
- 36' paved width
- 0.5' curb
- 6' planter strip
- 5' sidewalk 1' from property line
- 10' public utility easement across road frontage, outside of right-of-way (on both sides of road.)

NW Fendle Way (Local Residential)
- 50' right-of-way dedication
- 28' paved width
- 0.5' curb
- 5' planter strip
- 5' sidewalk 1' from property line
- 10' public utility easement across road frontage, outside of right-of-way (on both sides of road.)
- The sidewalk shall be curb tight through the bulb of the cul-de-sac with the ROW extending 5' behind the sidewalk to place water utilities behind the sidewalk in the cul-de-sac.

~~2.~~8. The access to the storm pond will have a driveway approach with an 8" section of concrete or 6" section with #4 rebar and be PROWAG compliant. The access will be paved to city standards with 10" of 1 ½" – 0 crushed rock under 2" of ¾" – 0 crushed rock and a 3" level 2 WMAC paved section to accommodate maintenance vehicles.

~~3.~~9. The pedestrian access off the end of Fendle Way shall be an improved 10-foot-wide concrete sidewalk connecting to the sidewalk on Meadows Drive. The pedestrian access will be located within a 20 foot wide continuous public access easement.

~~4.~~10. Within the 20 foot public access easement it shall include public amenities such as two benches as shown, walkway lighting, split rail fencing, and upgraded landscaping, or other amenities as approved by the Planning Director.

~~5.~~11. Prior to site work the Developer shall work with Planning and Parks and Recreation staff to site and design a direct Pedestrian connection to the Jay Pearson Park and trail corridor.

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~~6.~~12. On-street parking will not be permitted within a 30-foot distance of street intersections measured from the terminus of the curb returns.

~~7.~~13. The City Public Works Department will install, at the applicant's expense, the necessary street signage (including stop signs, no parking signage, and street name signage), curb painting, and striping (including stop bars) associated with the development. The applicant shall reimburse the City for the signage and markings prior to the City's approval of the final plat.

~~8.~~14. The applicant shall submit cross sections for the public street system to be constructed. Cross sections shall depict utility location, street improvement elevation and grade, park strips, sidewalk location, and sidewalk elevation and grade. Said cross sections shall be submitted to the City Engineer for review and approval prior to submittal of the final plat. All such submittals must comply with the requirements of 13A of the Land Division Ordinance and must meet with the approval of the City Engineer.

~~9.~~15. Street grades and profiles shall be designed and constructed to meet the adopted Land Division Ordinance standards and the requirements contained in the Public Right-of-Way Accessibility Guidelines (PROWAG). Additionally, corner curb ramps shall be constructed to meet PROWAG requirements.

~~10.~~16. That the street improvements shall have the City's typical "teepee" section.

~~11.~~17. The applicant shall secure from the Oregon Department of Environmental Quality (DEQ) any applicable storm runoff and site development permits prior to construction of the required site improvements. Evidence of such permits shall be submitted to the City Engineer.

~~12.~~18. The applicant shall secure all required state and federal permits, including, if applicable, those related to construction of the storm drain outfalls, the federal Endangered Species Act, Federal Emergency Management Act, and those required by the Oregon Division of State Lands, and U.S. Army Corp of Engineers. Copies of the approved permits shall be submitted to the City.

~~13.~~19. That the applicant submit evidence that all fill placed in the areas where building sites are expected is engineered. Evidence shall meet with the approval of the City Building Division and the City Engineering Division.

SANITARY SEWER

~~14.~~20. A detailed, engineered sanitary sewage collection plan, which incorporates the requirements of the City's adopted Conveyance System Master Plan, must be submitted to and approved by the City Engineering Department. Any utility easements needed to comply with the approved sanitary sewage plan must be reflected on the final plat.

~~15.~~21. The City is proposing an alternate route for the sewer main as it prefers to avoid side lot sanitary sewer mains. Developers Engineer to determine if the proposed route is feasible.

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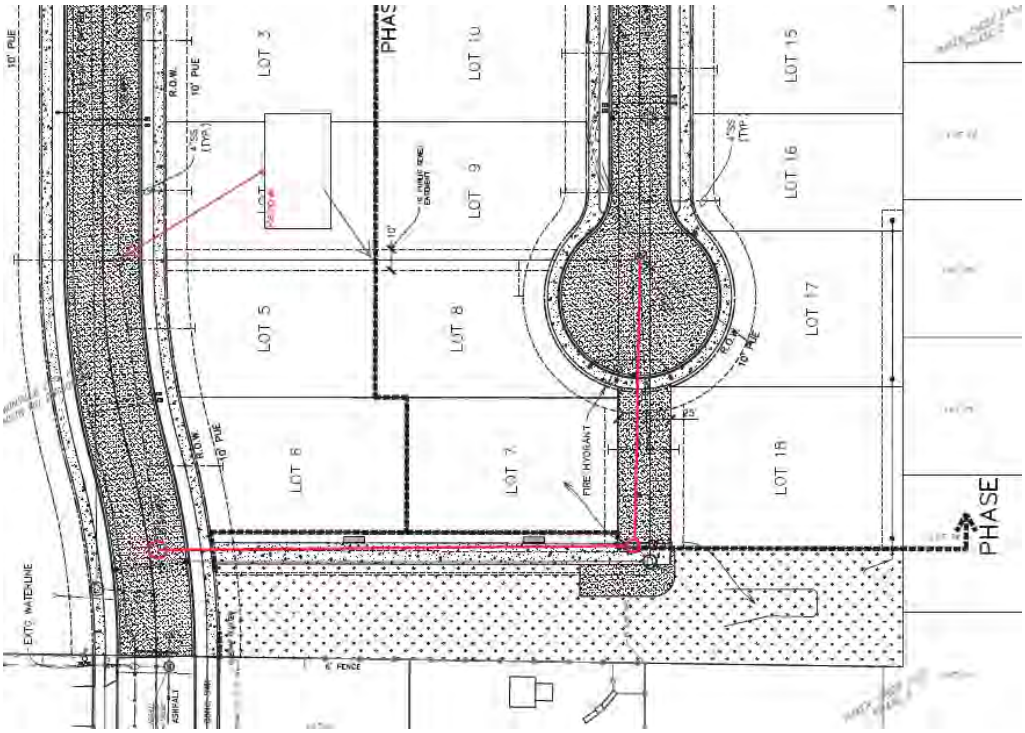

STORM DRAINAGE

~~16.~~22. Prior to site work a detailed, engineered storm drainage plan, which satisfies the requirements of the City's Storm Drainage Master Plan, and that demonstrates that the existing downstream storm drainage system has adequate capacity, must be submitted to and approved by the City Engineering Department. Any utility easements needed to comply with the approved plan must be reflected on the final plat.

~~17.~~23. No additional storm drainage runoff shall be conveyed onto any adjacent property without the appropriate public and/or private storm drainage easements. Copies of recorded private easements must be provided to the City prior to the City's approval of the final plat. Any offsite public easements must be dedicated to and accepted by the City prior to the City's approval of the final plat. The HOA will be responsible for the maintenance for the wetland plantings and fencing.

PRIOR TO FINAL PLAT

24. Submit documents creating a Homeowner's Association for the subdivision and assigning to it maintenance responsibilities of any common ownership features must be submitted to and approved by the Planning Director. In order to assure that the Homeowner's Association maintains and repairs any needed improvements, the Covenants, Conditions, and Restrictions (CC&Rs) shall explicitly require the Homeowner's Association to provide notice to the City prior to amending the CC&Rs, and that all such amendments shall be subject to approval by the Planning Director. Additionally, the CC&Rs shall prohibit the Homeowner's Association from disbanding without the consent of the Planning Director. The CC&Rs shall be reviewed by and subject to City approval prior to final plat approval.

25. Prior to final plat the restrictive Covenants, Conditions, and Restrictions (CC&Rs) shall be prepared for the development and approved by the Planning Director.

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~~18.~~26. The final plat shall reflect that access to the detention pond will be granted to the City for maintenance of the structures.

~~19.~~27. The final plat shall reflect that Tract A will be private.

~~20.~~28. The final plat shall reflect that the pedestrian pathway within tract A will be ~~privat~~privately maintained but have a public access easement over its entirety.~~e~~. The tract shall have private maintenance agreements which must be approved by the City prior to the City's approval of the final plat.

~~21.~~29. The final plat shall reflect that the sanitary line between Fendle Way and Meadows Dr shall be public.

~~22.~~30. Street names shall be submitted to the Planning Director for review and approval prior to submittal of the final plat.

~~23.~~31. The final plat shall include 10-foot public utility easements along both sides of all public rights-of-way for the placement and maintenance of required utilities.

~~24.~~32. The final plat shall include use, ownership, and maintenance rights and responsibilities for all easements and tracts.

~~25.~~33. The final plat shall include a public access easement from the terminus of Fendle Way to Meadows Drive.

~~26.~~34. The required public improvements shall be installed to the satisfaction of the responsible agency prior to the City's approval of the final plat. Prior to the construction of the required public improvements, the applicant shall enter into a Construction Permit Agreement with the City Engineering Department, and pay the associated fees.

~~27.~~35. Prior to final plat the applicant shall submit a draft copy of the subdivision plat to the City Engineer for review and comment which shall include any necessary cross easements for access to serve all the proposed parcels, and cross easements for utilities which are not contained within the lot they are serving, including those for water, sanitary sewer, storm sewer, electric, natural gas, cable, and telephone. A current title report for the subject property shall be submitted with the draft plat. Two copies of the final subdivision plat mylars shall be submitted to the City Engineer for the appropriate City signatures. The signed plat mylars will be released to the applicant for delivery to McMinnville Water and Light and the County for appropriate signatures and for recording.

~~28.~~36. The City will not maintain the proposed enhanced wetland facility or proposed bioswale along the south boundary of the subject property. The City will maintain the structures (inlets, outfalls, WQ manholes, flow control MH's, etc).

~~29.~~37. All of Tract A, including the proposed wetland and associated pedestrian path should remain private.

~~30.~~38. Prior to final plat the applicant shall submit an application for a street tree plan and landscaping for Tract A and the pedestrian path to the Landscape Review Committee for review and approval prior to final plat submittal in accordance with Section 17.58. 100 of the Zoning Ordinance. The plan shall provide sufficient detail about location of utility services to the lots, locations of street lights, pedestals, and meter boxes, to evaluate the suitability of proposed street tree planting locations.

~~31.~~39. Prior to final plat all street trees shall be installed or security in place. All trees shall be a two-inch minimum caliper, exhibit size and growing characteristics appropriate for the

particular planting strip, and be spaced as appropriate for the selected species and as may be required for the location of above ground utility vaults, transformers, light poles, and hydrants.

~~32.~~40. Submit a Subdivision Design Application form to McMinnville Water and Light. The project will require the developer to enter into a Line Extension Agreement (contract) with McMinnville Water and Light (MW&L). The public water system will need to be designed by the Developer's engineer and reviewed/approved by MW&L.

~~33.~~41. Submit a Subdivision Design Application form to McMinnville Water and Light. The project will require the developer to enter into a Line Extension Agreement (contract) with McMinnville Water and Light. The portion of the PUE included in the Drainage Improvements abutting NW Meadows needs to be constructed with an elevation and profile that ensures utilities can be extended through it in a typical manner.

PRIOR TO ISSUANCE OF BUILDING PERMITS

~~34.~~42. The applicant shall coordinate the location of clustered mailboxes with the Postmaster, and the location of any clustered mailboxes shall meet the accessibility requirements of PROWAG and the State of Oregon Structural Specialty Code.

~~35.~~43. The applicant shall install fire hydrants to serve this development as may be required by the McMinnville Fire Department. Also, if fire hydrants are required, they shall be in working order prior to the issuance of building permits.

~~36.~~44. On-street parking will be restricted at all street intersections, in conformance with the requirements of the City's Land Development Ordinance.

~~37.~~45. The applicant shall provide a minimum of twenty-five percent (25%) of the single-family lots for sale to the general public. The applicant shall provide information detailing the number of lots that will be made available for individual sale to builders for review and approval by the Planning Director prior to recording of the final plat. Upon approval, the referenced lots will be made available for sale to the general public for a minimum of one hundred eighty ~~twenty~~ (18~~2~~0) days.

~~38.~~46. Prior to issuance of building permits all applicable SDCs, including Parks SDCs shall be paid.

~~39.~~47. Prior to issuance of building permits Housing Variety shall be ensured. The neighborhood shall have a variety of building forms and architectural variety to avoid monoculture design.

~~40.~~48. If a security was provided prior to final plat for installation of street trees, the applicant shall complete installation of street trees, per the timing described in Subsection (B) below. The applicant shall plant street trees within curbside planting strips in accordance with the approved street tree plan. All street trees shall be of good quality and shall conform to American Standard for Nursery Stock (ANSI Z60.1). The Planning Director reserves the right to reject any plant material which does not meet this standard.

A. Trees shall be provided with root barrier protection in order to minimize infrastructure and tree root conflicts. The barrier shall be placed on the building side of the tree and the curb side of the tree. The root barrier protection shall be placed in 10-foot lengths, centered on the tree, and to a depth of eighteen (18) inches. In addition, all trees shall be provided with deep watering tubes to promote deep root growth.

B. Each year the applicant shall install street trees, from November 1 to March 1, adjacent to those properties on which a structure has been constructed and received final

occupancy. This planting schedule shall continue until all platted lots have been planted with street trees.

C. It shall be the applicant's responsibility to relocate trees as may be necessary to accommodate individual building plans. The applicant shall also be responsible for the maintenance of the street trees, and for the replacement of any trees which may die ~~due to neglect or vandalism~~, for one year from the date of planting

~~41.~~49. Any improvements which were secured prior to final plat approval shall be completed in accordance with the construction permit agreement.

SECTION III. COMMENTS:

Agency Comments
This matter was referred to the following public agencies for comment: McMinnville Fire Department, Police Department, Parks and Recreation Department, Engineering and Building Departments, City Manager, and City Attorney, McMinnville School District No. 40, McMinnville Water and Light, Yamhill County Public Works, Yamhill County Planning Department, Recology Western Oregon, Frontier Communications, Comcast, Northwest Natural Gas. Comments were received from the Engineering Department and the Oregon Department of State Lands.

Public Comments
Notice of this request was mailed to property owners located within 300 feet of the subject site. Notice of the public hearing was also provided in the News Register on Friday April 1, 2022. As of the publish date of the Planning Commission packet, no public testimony had been received by the Planning Department.

SECTION IV. FINDINGS OF FACT

1. The applicant held a neighborhood meeting in accordance with Section 17.72.095 of the Zoning Ordinance on July 20, 2021.

2. The application was submitted on September 1, 2021

3. The application was deemed complete on February 25, 2022.

4. Notice of the application was referred to the following public agencies for comment in accordance with Section 17.72.120 of the Zoning Ordinance: McMinnville Fire Department, Police Department, Parks and Recreation Department, Engineering and Building Departments, City Manager, and City Attorney, McMinnville School District No. 40, McMinnville Water and Light, Yamhill County Public Works, Yamhill County Planning Department, Recology Western Oregon, Frontier Communications, Comcast, Northwest Natural Gas. Notice was also provided to the Oregon Department of State Lands.

   Comments received from agencies are addressed in the Decision Document. The letter from the Department of State Lands (DSL) was submitted as part of the application by the applicant, and DSL copied the City on the letter.

5. Notice of the application and the April 21, 2022 Planning Commission public hearing was mailed to property owners within 300 feet of the subject property in accordance with Section 17.72.120 of the Zoning Ordinance.

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6. Notice of the application and the April 21, 2022 Planning Commission public hearing was published in the News Register on Friday, April 1, 2021, in accordance with Section 17.72.120 of the Zoning Ordinance.

   No public testimony was submitted to the Planning Department prior to the Planning Commission public hearing.

7. On April 21, 2022 the Planning Commission held a duly noticed public hearing to consider the request.

SECTION V. SUMMARY OF APPLICABLE REVIEW CRITERIA

The following summarizes the review criteria applicable to this decision, in the order in which they are addressed:

Applicable Review Criteria
17.18 Residential Zones
17.51 Planned Development Overlay
17.53 Land Divisions Standards
17.74 Review Criteria
Comprehensive Plan
Great Neighborhood Principles

SECTION VI. CONCLUSIONARY FINDINGS:

The following subsections address only the approval criteria applicable to this decision.

Chapter 17.18. R-3 Two-Family Residential Zone

17.18.010. Permitted Uses.
17.18.030. Lot Size.
17.18.040. Yard Requirements.
17.18.060. Density Requirements

FINDING: SATISFIED WITH CONDITIONS. The applicant's proposed tentative plan demonstrates compliance with the applicable standards of the sections listed above.

17.18.010. Permitted Uses. The proposed use of the lots is 18 detached dwellings. These are permitted uses in the R-3 zone.

17.18.030. Lot Size. The minimum lot size for the R-3 zone is 6,000 square feet. Lots proposed range from 5,436 at the smallest and 8,363 square feet at the largest. The average being 6,294 SF.

17.18.040. Yard Requirements. With the proposed lot sizes and shapes, there is no foreseeable difficulty in meeting setback requirements.

17.18.060. Density Requirements. Based on the proposed uses and lot sizes, the proposal complies with the applicable density requirements of this section.

17.51 PLANNED DEVELOPMENT OVERLAY

Attachments:
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17.51.020 Standards and requirements. The following standards and requirements shall govern the application of a planned development in a zone in which it is permitted:

A. The principal use of land in a planned development shall reflect the type of use indicated on the comprehensive plan or zoning map for the area. Accessory uses within the development may include uses permitted in any zone, except uses permitted only in the M-2 zone are excluded from all other zones. Accessory uses shall not occupy more than twenty-five percent of the lot area of the principal use;

B. Density for residential planned development shall be determined by the underlying zone designations. (Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).

FINDING: SATISFIED. The subject property has a residential designation on the comprehensive plan. The proposed development is a residential development; therefore this objective has been met. The proposed development with concurrent zone change to R-3, subdivision and Planned Development, the proposed lot size ranges in size from 5,436 SF to 8,363 SF, and lot density of 4.8 dwelling units/acre. Therefore, these standards are met.

17.51.030 Procedure

C. The Commission shall consider the preliminary development plan at a meeting at which time the findings of persons reviewing the proposal shall also be considered. In reviewing the plan, the Commission shall need to determine that:

1. **There are special physical conditions or objectives of a development which the proposal will satisfy to warrant a departure from the standard regulation requirements;**

The special physical conditions of the site include the infill nature of the development (surrounded by residential development with a neighborhood park to the west) and the manmade drainages onsite limit the configurations of development. In addition, the manmade wetlands under the Meadows Drive connection and along the phase line are proposed to be filled. However, the applicant is proposing to enhance the manmade wetland ditch along the south property line to ensure proper drainage and provide enhanced physical conditions of the site.

The objective by the applicant is to provide a diversity of lot sizes and setback flexibility that will contribute to variety in the development pattern of the community housing, and varied housing sizes and styles. The applicant is also proposing a concurrent zone change from R-1 to R-3 to provide lot sizes ranging from rezoning from 5436 SF to 8363 SF and reduced side yard setbacks from 7ft to 5ft, which would not be allowed without a Planned Development Overlay and/or Zone Change. The applicant is proposing to sell the lots to several different builders to further provide variety in housing types and styles to home consumers in McMinnville. The reduced side yard setback provides the builders more flexibility in housing types and styles. The planned development overlay will establish the lot sizes and setbacks for all future development on this site.

2. **Resulting development will not be inconsistent with the Comprehensive Plan objectives of the area;**

The application is consistent with the Comprehensive Plan. Comprehensive findings are found below.

3. **The development shall be designed so as to provide for adequate access to and efficient provision of services to adjoining parcels;**

The proposed development is an infill development. The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. In addition, a 10ft wide concrete multiuse path is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson

Neighborhood Park. Therefore, access to the existing surrounding streets will provide efficient access to services to adjoining parcels.

4. **The plan can be completed within a reasonable period of time;**

The applicant is proposing to construct the improvements in the summer of 2022 for lots to be sold in the fall and winter of 2022. This development is typical in the industry. Therefore, this objective has been met.

5. **The streets are adequate to support the anticipated traffic, and the development will not overload the streets outside the planned area;**

The proposed development is an infill development. The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. In addition, a 10ft wide concrete multiuse path. The density of units is consistent with the City's TSP and therefore will not overload the streets outside the planned area.

6. **Proposed utility and drainage facilities are adequate for the population densities and type of development proposed;**

As shown the civil plans, the applicant is proposing to extend existing sewer and water systems to service the development. The proposed density (4.8 units/acre) is less than the 6 units/acre utilized in the City Sanitary Sewer Conveyance System Master Plan to size the sewer mains. The applicant is proposing to provide stormwater detention in accordance with the City's Storm Drainage Master Plan, which accounts for lot density. All utility design will be in accordance with City standards. Therefore, this standard is met.

7. **The noise, air, and water pollutants caused by the development do not have an adverse effect upon surrounding areas, public utilities, or the city as a whole;**

The proposed development will not create a land use that will cause noise incompatibility with surrounding uses. The proposed development will not facilitate any use generating major air emissions beyond what is expected for residential development. The proposed development plans to capture, detain and treat stormwater runoff in a combination swale and detention facility, therefore typical stormwater pollutants and will not have an adverse effect on surrounding areas. The public utilities are all sized to be consistent with the City's Sewer Conveyance and Storm Drainage Master Plans, and therefore will not have an adverse effect on public utilities or the City as a whole.

FINDING: SATISFIED. As demonstrated by the findings above the proposed development is consistent with the existing land use pattern in the area and final connection piece NW Meadows Road. The density of units is consistent with the City's TSP and therefore will not overload the streets outside the planned area. Overall, the development is compatible with the surrounding uses.

17.53 LAND DIVISION STANDARDS

Approval of Streets and Ways

17.53.100. Creation of Streets.
17.53.101. Streets.
17.53.103. Blocks.
17.53.105. Lots.
17.53.110. Lot Grading.
17.53.120. Building Lines.
17.53.130. Large Lot Subdivision.
17.53.140. Left-Over Land.

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FINDING: SATISFIED WITH CONDITIONS. The applicant's proposed tentative plan demonstrates compliance with the applicable standards of the sections listed above, subject to conditions of approval.

17.53.100. Creation of Streets. All streets within the subdivision are proposed as public streets, to be dedicated on the plat, except that access to Lot 7 and Lot 18 will be via private street at the terminus of the Fendle Way cul-de-sac.

17.53.101. Streets.

- **A. General** The proposal complies with the street standards of 17.53.101. The street layout provides for the continuation of the alignment of Meadows Drive and Fendle Way with no offset intersections.
- **B. Right-of-Way and steet widths.** The proposed new streets right-of-way widths and street width are in conformance with the widths specified in the City's Complete Street Design Standards for a minor collector and local residential streets.
- **C. Reserve strips.** No reserve strips are proposed.
- **D. Alignment.** The proposed new streets are in alignment with existing streets.
- **E. Future extension of streets.** Surrounding properties are developed, so there isn't a need for street plugs for future street extensions.
- **F. Intersection angles.** No intersections are proposed.
- **G. Existing Streets.** The proposed street will be designed to match the existing streets.
- **H. Half streets.** No half streets are proposed.
- **I. Cul-de-sacs**. A cul-de-sac is proposed at the end of Fendle Way. The length does not exceed 400 feet and only serves 16 lots including the two lots off the end of cul-de-sac that are accessed by private street.
- **J. Eyebrows.** No eyebrows are proposed.
- **K. Street Names.** No new street names are proposed.
- **L. Grades and curves**. No excessive grades are required for the proposed street.
- **M. Streets adjacent to railroad.** There are no proposed streets adjacent to railroads, no frontage roads, and no alleys.
- **N. Frontage roads.** No frontage roads are proposed or required with the proposed layout.
- **O. Alleys.** No alleys proposed.
- **P. Private way/drive.** As a condition of approval, the proposed private drive will need to be constructed to the same structural standards that would apply to a public street, and a storm drainage plan will be required.
- **Q. Bikeways.** Meadows drive is a minor collector and bikeways are designed to share the roadway with cars.
- **R. Residential Collector Spacing**. Not applicable.
- **S. Sidewalks.** Sidewalks are consistent with 17.53.101(S) and (T) and the Complete Street Design Standards, except that cul-de-sac will be curbtight without a 5' planter strip.
- **T. Park strips.** Five foot planter strips are proposed along all proposed streets, except around the cul-de-sac bulb.
- **U. Gates.** No gates are proposed within the public right-of-way or for the private way serving Lot 7 and 18.

17.53.103. Blocks. Due to the existing development, street patterns, and drainage resource onside the block length and perimeter standards will be met with the use of a pedestrian connection. With that is will not exceed the 400 foot block length and 1,600 foot block perimeter. Measuring from the street centerline the perimeter is approximately

1,490 feet. This is authorized when "topography or location of adjoining streets justifies an exception."

17.53.105. Lots. The proposed lots are suitable shapes for development, generally rectangular with side lot lines perpendicular to the right-of-way. Lots are not excessively deep, and lot depth doesn't exceed two times the width on lots. There will be six lots that will access Meadows drive a minor collector. Consistent with the community meadows drive has been designed and intended to have homes front and have driveway access off this street. There are no through lots are proposed, and no flag lots are proposed.

17.53.110. Lot Grading. No excessive slopes are proposed. Grading and fill associated with the proposal, including piping of the open drainageway will be subject to review by the appropriate departments and permitting agencies as a condition of approval.

17.53.120. Building Lines. Special building setback lines are proposed with the planned development overlay.

17.53.130 Large Lot Subdivision is not applicable because this is not a large lot subdivision.

17.53.140 Left-Over Land is not applicable because the proposed subdivision doesn't result in left-over land.

Improvements

17.53.150. Improvement Procedures.
17.53.151. Specifications for Improvements.
17.53.153. Improvement Requirements.

17.53.150. Improvement Procedures. The applicant will be required to comply with the improvement procedures as a condition of approval.

17.53.151. Specifications for Improvements. As a condition of approval, the applicant will be required to provide civil drawings that comply with all City specifications.

17.53.153. Improvement Requirements. The applicant's proposal includes improvements necessary to serve lots consistent with the requirements of this section. As a condition of approval, the applicant will be required to provide civil drawings that comply with all City specifications of this section.

FINDING: SATISFIED WITH CONDITIONS. The applicant's proposed tentative plan demonstrates compliance with the applicable standards of the sections listed above.

17.74 REVIEW CRITERIA

17.74.020. Comprehensive Plan Map Amendment and Zone Change - Review Criteria.
An amendment to the official zoning map may be authorized, provided that the proposal satisfies all relevant requirements of this ordinance, and also provided that the applicant demonstrates the following:

A. The proposed amendment is consistent with the goals and policies of the Comprehensive Plan;

Attachments:
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FINDING: SATISFIED. See responses to applicable Comprehensive Plan policies below.

B. The proposed amendment is orderly and timely, considering the pattern of development in the area, surrounding land uses, and any changes which may have occurred in the neighborhood or community to warrant the proposed amendment;

FINDING: SATISFIED. The proposed development is located in an area with available services, with a mix of zoning and residential development, in proximity to shopping, services, parks, and transit. The city's Buildable Land Inventory identifies a deficit of residential land.

C. Utilities and services can be efficiently provided to serve the proposed uses or other potential uses in the proposed zoning district.

FINDING: SATISFIED. The proposed development is located in an area with available services to serve the property.

When the proposed amendment concerns needed housing (as defined in the McMinnville Comprehensive Plan and state statute), criterion "B" shall not apply to the rezoning of land designated for residential use on the plan map.

FINDING: SATISFIED. Criterion B is satisfied; however, the proposed amendment relates to needed housing, so this application is not required to meet Criterion B.

In addition, the housing policies of the McMinnville Comprehensive Plan shall be given added emphasis and the other policies contained in the plan shall not be used to: (1) exclude needed housing; (2) unnecessarily decrease densities; or (3) allow special conditions to be attached which would have the effect of discouraging needed housing through unreasonable cost or delay.

FINDING: Satisfied. As addressed below, the housing policies of the Comprehensive Plan are addressed, and the effect of this decision doesn't exclude needed housing, decrease densities, or discourage needed housing through unreasonable cost or delay.

Comprehensive Plan Volume II:

The following Goals, Policies, and Proposals from Volume II of the Comprehensive Plan provide criteria applicable to this request:

The implementation of most goals, policies, and proposals are accomplished through the provisions, procedures, and standards in the city codes and master plans, which are sufficient to adequately address applicable goals, polices, and proposals as they apply to a development proposal at the time of application.

GOAL V 1: TO PROMOTE DEVELOPMENT OF AFFORDABLE, QUALITY HOUSING FOR ALL CITY RESIDENTS.

58.00 City land development ordinances shall provide opportunities for development of a variety of housing types and densities.

FINDING: SATISFIED. The proposed development lots sizes will vary, rezoning from R-1 to R-3 will create lot sizes in the range of 5436 SF to 8363 SF, which would not be allowed under

current zoning. In addition, the R-3 zone allows dual family living in addition to single dwellings. This coupled with HB 2001, which allows multi-dwelling development on residential zoned property creates the option for numerous housing types for diverse incomes spanning different generations.

GOAL V 2: TO PROMOTE A RESIDENTIAL DEVELOPMENT PATTERN THAT IS LAND INTENSIVE AND ENERGY-EFFICIENT, THAT PROVIDES FOR AN URBAN LEVEL OF PUBLIC AND PRIVATE SERVICES, AND THAT ALLOWS UNIQUE AND INNOVATIVE DEVELOPMENT TECHNIQUES TO BE EMPLOYED IN RESIDENTIAL DESIGNS.

71.09 Medium and High-Density Residential (R-3 and R-4) - The majority of residential lands in McMinnville are planned to develop at medium density range (4 – 8 dwelling units per net acre). Medium density residential development uses include small lot single-family detached uses, single family attached units, duplexes and triplexes, and townhouses. High density residential development (8 – 30 dwelling units per net acre) uses typically include townhouses, condominiums, and apartments:

1. **Areas that are not committed to low density development;**
2. **Areas that have direct access from collector or arterial streets;**
3. **Areas that are not subject to development limitations such as topography, flooding, or poor drainage;**
4. **Areas where the existing facilities have the capacity for additional development;**
5. **Areas within one-quarter mile of existing or planned public transportation; and**
6. **Areas that can be buffered from low density residential areas in order to maximize the privacy of established low density residential areas**

FINDING: SATISFIED. The proposed development is located in an area with available services, with a mix of zoning and residential development, in proximity to shopping, services, parks, and transit as documented in the application submittal. The proposed density is at 4.8 dwelling units/acre with the proposed R-1 to R-3 zone change, therefore this is at the low end of the medium density range which is consistent with the standard.

The site is relatively flat and is not located within a mapped flood plain. The applicant is proposing to enhance the wetlands onsite and provide drainage improvements.

There is public transportation located along Baker Creek Road. The proposed project is 755 ft from Baker Creek Road with is within ¼ mile of the existing public transportation.

71.10 The following factors should be used to define appropriate density ranges allowed through zoning in the medium density residential areas:

1. **The density of development in areas historically zoned for medium and high density development;**
2. **The topography and natural features of the area and the degree of possible buffering from established low density residential areas;**
3. **The capacity of the services;**
4. **The distance to existing or planned public transit;**
5. **The distance to neighborhood or general commercial centers; and**
6. **The distance from public open space. (Ord. 4796, October 14, 2003)**

FINDING: SATISFIED. The proposed development is located in an area with available services, with a mix of zoning and residential development, in proximity to shopping, services,

parks, and transit. The location allows for a development plan that can be designed to be compatible with nearby development and densities.

Planned Development Policies:

72.00 Planned developments shall be encouraged as a favored form of residential development as long as social, economic, and environmental savings will accrue to the residents of the development and the city.

73.00 Planned residential developments which offer a variety and mix of housing types and prices shall be encouraged.

74.00 Distinctive natural, topographic, and aesthetic features within planned developments shall be retained in all development designs.

75.00 Common open space in residential planned developments shall be designed to directly benefit the future residents of the developments. When the open space is not dedicated to or accepted by the City, a mechanism such as a homeowners association, assessment district, or escrow fund will be required to maintain the common area.

76.00 Parks, recreation facilities, and community centers within planned developments shall be located in areas readily accessible to all occupants.

77.00 The internal traffic system in planned developments shall be designed to promote safe and efficient traffic flow and give full consideration to providing pedestrian and bicycle pathways.

78.00 Traffic systems within planned developments shall be designed to be compatible with the circulation patterns of adjoining properties.

FINDING: SATISFIED WITH CONDITIONS. The proposal will provide for single family residential homes on individual lots of various sizes, ranging from 5,436 SF to 8,363 SF. It will provide for homes that will be affordable to the residents of the City with moderate incomes.

As shown on the survey there are a couple of man made drainage ditches that were intended to be temporary with the Shadden Claim development to the north. There are two ditches, one that drains the park and the other that drains Meadows Drive. These ditches are considered wetlands by the most recent standards. The drainage ditch under Meadows Drive will be filled and widen and enhance the existing drainage ditch/wetlands that drains the park and flows along the southern property boundary. This ditch is proposed to be retained and enhanced.

The dedicated open space is proposed to be owned by a homeowners association and will thereby benefit the future residents of the development. The open space and associated multiuse path with benches is connected to all lots of the proposed development by a sidewalk in accordance with ADA standards and therefore is readily accessible to all applicants.

The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. Per the TSP a local

street and minor collectors have shared street access with bikes and vehicle's. In addition, a 10ft wide concrete multiuse path is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park.

Residential Design Policies:

79.00 The density allowed for residential developments shall be contingent on the zoning classification, the topographical features of the property, and the capacities and availability of public services including but not limited to sewer and water. Where densities are determined to be less than that allowed under the zoning classification, the allowed density shall be set through adopted clear and objective code standards enumerating the reason for the limitations, or shall be applied to the specific area through a planned development overlay. Densities greater than those allowed by the zoning classification may be allowed through the planned development process or where specifically provided in the zoning ordinance or by plan policy. (Ord. 4796, October 14, 2003)

80.00 In proposed residential developments, distinctive or unique natural features such as wooded areas, isolated preservable trees, and drainage swales shall be preserved wherever feasible.

81.00 Residential designs which incorporate pedestrian and bikeway paths to connect with activity areas such as schools, commercial facilities, parks, and other residential areas, shall be encouraged.

82.00 The layout of streets in residential areas shall be designed in a manner that preserves the development potential of adjacent properties if such properties are recognized for development on the McMinnville Comprehensive Plan Map.

83.00 The City of McMinnville shall review the design of residential developments to insure site orientation that preserves the potential for future utilization of solar energy.

FINDING: SATISFIED. The proposed development is consistent with the density authorized by the zoning, topography, and availability of services.

There is a man made drainage ditche that was intended to be temporary with the Shadden Claim development to the north. The two ditches, one that drains the park and the other that drains Meadows Drive. These ditches are considered wetlands by the most recent standards. The proposal intends to fill the drainage ditch under Meadows Drive and widen and enhance the existing drainage ditch/wetlands that drains the park and flows along the southern property boundary. This ditch is proposed to be retained and enhanced located in Tract A.

The proposed development will provide necessary street improvements including the provision of curbs, gutter, sidewalks and planter strips on all of the streets within the proposed development. The necessary connection for pedestrians in this area to the school property, park, commercial area and the private open spaces has been met.

The lots have been as designed for detached dwelling units, therefore they can have windows on all four sides of each building allowing for solar passive gains. Upon development of the lots the contactor could install solar panel on structures.

Urban Policies:

99.00 An adequate level of urban services shall be provided prior to or concurrent with all proposed residential development, as specified in the acknowledged Public Facilities Plan. Services shall include, but not be limited to:

1. **Sanitary sewer collection and disposal lines. Adequate municipal waste treatment plant capacities must be available.**
2. **Storm sewer and drainage facilities (as required).**
3. **Streets within the development and providing access to the development, improved to city standards (as required).**
4. **Municipal water distribution facilities and adequate water supplies (as determined by City Water and Light). (as amended by Ord. 4796, October 14, 2003)**

FINDING: SATISFIED WITH CONDITIONS. As conditioned all public improvements will be constructed or bonded for prior to final plat.

Lot Sales Policy:

99.10 The City of McMinnville recognizes the value to the City of encouraging the sale of lots to persons who desire to build their own homes. Therefore, the City Planning staff shall develop a formula to be applied to medium and large size subdivisions, that will require a reasonable proportion of lots be set aside for owner-developer purchase for a reasonable amount of time which shall be made a part of the subdivision ordinance.

FINDING: SATISFIED WITH CONDITION. This requirement is addressed with a condition of approval requiring the applicant to make lots available for sale.

GOAL VI 1: TO ENCOURAGE DEVELOPMENT OF A TRANSPORTATION SYSTEM THAT PROVIDES FOR THE COORDINATED MOVEMENT OF PEOPLE AND FREIGHT IN A SAFE AND EFFICIENT MANNER.

Streets

118.00 The City of McMinnville shall encourage development of roads that include the following design factors:

5. Connectivity of local residential streets shall be encouraged. Residential cul-de-sac streets shall be discouraged where opportunities for through streets exist

121.00 The City of McMinnville shall discourage the direct access of small-scale residential developments onto major or minor arterial streets and major collector streets.

FINDING: SATISFIED. The proposed development is an infill development. The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the

applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south.

Parking

126.00 The City of McMinnville shall continue to require adequate off-street parking and loading facilities for future developments and land use changes.

FINDING: SATISFIED. The lots are large enough to accommodate off-street parking. The required two off-street parking spaces will be confirmed at building permit application for each residential home proposed.

Connectivity and Circulation

132.26.05 New street connections, complete with appropriately planned pedestrian and bicycle features, shall be incorporated in all new developments consistent with the Local Street Connectivity map. (Ord. 4922, February 23, 2010)

FINDING: SATISFIED WITH CONDITIONS. A 10ft wide concrete multiuse path is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. Additionally the project will be conditioned to improve a direct connection to the Jay Pearson park, from Meadows drive west to the multi-use trail. Therefore, access to the existing surrounding streets will provide efficient pedestrian and bike access to adjoining parcels.

Circulation

132.41.05 Cul-de-sac streets in new development should only be allowed when connecting neighborhood streets are not feasible due to existing land uses, topography, or other natural and physical constraints. (Ord. 4922, February 23, 2010)

132.41.30 Promote Street Connectivity – The City shall require street systems in subdivisions and development that promote street connectivity between neighborhoods. (Ord. 4922, February 23, 2010)

FINDING: SATISFIED WITH CONDITIONS. The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. Due to the existing wetland constraints a through street for Fendle Drive is not feasible In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south.

GREAT NEIGHBORHOOD PRINCIPLES

187.10 The City of McMinnville shall establish Great Neighborhood Principles to guide the land use patterns, design, and development of the places that McMinnville citizens live, work, and play. The Great Neighborhood Principles will ensure that all developed places include characteristics and elements that create a livable, egalitarian, healthy, social, inclusive, safe, and vibrant neighborhood with enduring value, whether that place is a completely new development or a redevelopment or infill project within an existing built area.

Attachments:
Attachment 1 - Application
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187.20 The Great Neighborhood Principles shall encompass a wide range of characteristics and elements, but those characteristics and elements will not function independently. The Great Neighborhood Principles shall be applied together as an integrated and assembled approach to neighborhood design and development to create a livable, egalitarian, healthy, social, inclusive, safe, and vibrant neighborhood, and to create a neighborhood that supports today's technology and infrastructure, and can accommodate future technology and infrastructure.

187.30 The Great Neighborhood Principles shall be applied in all areas of the city to ensure equitable access to a livable, egalitarian, healthy, social, inclusive, safe, and vibrant neighborhood for all McMinnville citizens.

187.40 The Great Neighborhood Principles shall guide long range planning efforts including, but not limited to, master plans, small area plans, and annexation requests. The Great Neighborhood Principles shall also guide applicable current land use and development applications.

FINDING: SATISFIED. The applicant's proposal is subject to the great neighborhood principles and findings for each are found below.

187.50 The McMinnville Great Neighborhood Principles are provided below. Each Great Neighborhood Principle is identified by number below (numbers 1 – 13), and is followed by more specific direction on how to achieve each individual principle.

1. **Natural Feature Preservation. Great Neighborhoods are sensitive to the natural conditions and features of the land.**
   a. **Neighborhoods shall be designed to preserve significant natural features including, but not limited to, watercourses, sensitive lands, steep slopes, wetlands, wooded areas, and landmark trees.**

FINDING: SATISFIED. The proposed subdivision is proposing to relocate the man made ditches and wetlands associated with the construction of the Shadden Claim development. A portion of the existing man made wetlands will be preserved and enhanced along the southern section of the development (refer to the Drainage Rehabilitation Plan). The existing man made ditch and associated wetlands are proposed to be filled in order to connect Meadows Drive and provide lots along the street to border the neighborhood park, while the wetlands along the southern boundary of the subject property are proposed to be enhanced. The enhanced drainage ditch allows drainage from the parks property to the west to match the existing flow path to the east, connecting to the existing ditch. The existing ditch/wetlands will be enhanced with landscaping as shown the wetland-fill landscape restoration plan (refer to the Drainage Rehabilitation Plan).

2. **Scenic Views. Great Neighborhoods preserve scenic views in areas that everyone can access.**
   a. **Public and private open spaces and streets shall be located and oriented to capture and preserve scenic views, including, but not limited to, views of significant natural features, landscapes, vistas, skylines, and other important features.**

FINDING: SATISFIED. The proposed subdivision is located near a park and provides approximately 15,086 square feet of open space to preserve the scenic views that currently

exist. The proposed development will also construct a multiuse path to connect NW Fendle Way and Meadows Drive which will include two benches. This will allow residents a space to view the wetland area and adjacent park to the west.

3. **Parks and Open Spaces. Great Neighborhoods have open and recreational spaces to walk, play, gather, and commune as a neighborhood.**
   a. **Parks, trails, and open spaces shall be provided at a size and scale that is variable based on the size of the proposed development and the number of dwelling units.**
   b. **Central parks and plazas shall be used to create public gathering spaces where appropriate.**
   c. **Neighborhood and community parks shall be developed in appropriate locations consistent with the policies in the Parks Master Plan.**

FINDING: SATISFIED AS CONDITIONED. The proposed subdivision is located across the street from the Jay Pearson Neighborhood Park. A public access is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. Additionally, the project will be conditioned to improve a direct connection to the Jay Pearson park, from Meadows drive west to the multi-use trail.

4. **Pedestrian Friendly. Great Neighborhoods are pedestrian friendly for people of all ages and abilities.**
   a. **Neighborhoods shall include a pedestrian network that provides for a safe and enjoyable pedestrian experience, and that encourages walking for a variety of reasons including, but not limited to, health, transportation, recreation, and social interaction.**
   b. **Pedestrian connections shall be provided to commercial areas, schools, community facilities, parks, trails, and open spaces, and shall also be provided between streets that are disconnected (such as cul-de-sacs or blocks with lengths greater than 400 feet).**

FINDING: SATISFIED. Sidewalks are proposed along the Meadows Drive connection as well as the proposed cul-de-sac extension of NW Fendle Way. A 10 foot wide multiuse public access sidewalk is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. Additionally, the project will be conditioned to improve a direct connection to the Jay Pearson park, from Meadows drive west to the multi-use trail.

5. **Bike Friendly. Great Neighborhoods are bike friendly for people of all ages and abilities.**
   a. **Neighborhoods shall include a bike network that provides for a safe and enjoyable biking experience, and that encourages an increased use of bikes by people of all abilities for a variety of reasons, including, but not limited to, health, transportation, and recreation.**
   b. **Bike connections shall be provided to commercial areas, schools, community facilities, parks, trails, and open spaces.**

FINDING: SATISFIED. The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. Meadows Drive (a minor collector) will also be improved to match the existing street width of the existing portion, north and south. Per the TSP a local street and minor collectors have shared street access with bikes and vehicles. In addition, a 10 foot wide concrete multiuse path is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. A direct connection to the Jay Pearson Park, from Meadows Drive west to the multi-use trail is also conditioned as a required improvement

6. **Connected Streets. Great Neighborhoods have interconnected streets that provide safe travel route options, increased connectivity between places and destinations, and easy pedestrian and bike use.**
   a. **Streets shall be designed to function and connect with the surrounding built environment and the existing and future street network, and shall incorporate human scale elements including, but not limited to, Complete Streets features as defined in the Comprehensive Plan, grid street networks, neighborhood traffic management techniques, traffic calming, and safety enhancements.**
   b. **Streets shall be designed to encourage more bicycle, pedestrian and transit mobility with a goal of less reliance on vehicular mobility.**

FINDING: SATISFIED. The proposed subdivision will connect the north and south dead-end street of Meadows Drive and extend Fendle Way to terminate in a cul-de-sac. The proposed development will also be constructed with sidewalks and a multiuse path to connect NW Fendle Way and Meadows Drive. This connection will provide multiuse access from the neighborhood to the city park located west of the subdivision.

7. **Accessibility. Great Neighborhoods are designed to be accessible and allow for ease of use for people of all ages and abilities.**

   a. **To the best extent possible all features within a neighborhood shall be designed to be accessible and feature elements and principles of Universal Design.**
   b. **Design practices should strive for best practices and not minimum practices.**

FINDING: SATISFIED. The proposed subdivision street, sidewalk and pedestrian access grades are relatively flat and will be designed to meet all public works design standards and ADA Standards. Therefore, the development will allow ease of use for people of all ages.

8. **Human Scale Design. Great Neighborhoods have buildings and spaces that are designed to be comfortable at a human scale and that foster human interaction within the built environment.**
   a. **The size, form, and proportionality of development is designed to function and be balanced with the existing built environment.**
   b. **Buildings include design elements that promote inclusion and interaction with the right-of-way and public spaces, including, but not limited to, building orientation towards the street or a public space and placement of vehicle-oriented uses in less prominent locations.**

c. **Public spaces include design elements that promote comfortability and ease of use at a human scale, including, but not limited to, street trees, landscaping, lighted public areas, and principles of Crime Prevention through Environmental Design (CPTED).**

FINDING: SATISFIED. The proposed development is an infill development. The proposed lots will face either the extension of Fendle Way or the connection of Meadows Drive or a public use area. The building will have garages so the vehicles could be stored out of view. The allowable building sizes based on the setbacks will balance with the proposed street extensions and be compatible with the surrounding neighborhood. Meadows Drive and Fendle Way will all have landscaping, streetlights, and street trees to promote a comfortable and ease of use throughout the built environment. In addition, the 10 foot wide multiuse path to connect the public built environment of Fendle Way and NW Meadows Drive. These design elements promote comfort, ease of use and the principles of Crime Prevention through Environmental Design.

9. Mix of Activities. Great Neighborhoods provide easy and convenient access to many of the destinations, activities, and local services that residents use on a daily basis.

a. Neighborhood destinations including, but not limited to, neighborhood-serving commercial uses, schools, parks, and other community services, shall be provided in locations that are easily accessible to surrounding residential uses.

b. Neighborhood-serving commercial uses are integrated into the built environment at a scale that is appropriate with the surrounding area.

c. Neighborhoods are designed such that owning a vehicle can be optional.

FINDING: SATISFIED. The proposed subdivision provides public access along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. The project will be conditioned to improve a direct connection to the Jay Pearson Park, from Meadows drive west to the multi-use trail.
These connections will provide efficient pedestrian access for the residents.

10. Urban-Rural Interface. Great Neighborhoods complement adjacent rural areas and transition between urban and rural uses.

a. **Buffers or transitions in the scale of uses, buildings, or lots shall be provided on urban lands adjacent to rural lands to ensure compatibility.**

FINDING: SATISFIED. The proposed subdivision is designed in accordance to blend with the surrounding neighborhood with lot sizes and building design that is consistent with the existing surrounding neighborhood.

11. Housing for Diverse Incomes and Generations. Great Neighborhoods provide housing opportunities for people and families with a wide range of incomes, and for people and families in all stages of life.

a. **A range of housing forms and types shall be provided and integrated into neighborhoods to provide for housing choice at different income levels and for different generations.**

FINDING: SATISFIED. The proposed development provides housing for diverse incomes and different generations by the combination of varying lots sizes, rezoning from R-1 to R-3 and HB 2001. As shown on the subdivision plan the lot sizes vary from 5436 SF to 8363 SF, which would not be allowed under current zoning. In addition, the R-3 zone allows dual family living in addition to single dwellings. This coupled with HB 2001, which allows multi-dwelling development on residential zoned property creates the option for numerous housing types for diverse incomes spanning different generations.

12. Housing Variety. Great Neighborhoods have a variety of building forms and architectural variety to avoid monoculture design.
- **a. Neighborhoods shall have several different housing types.**
- b. **Similar housing types, when immediately adjacent to one another, shall provide variety in building form and design.**

FINDING: SATISFIED AS CONDITIONED. The applicant is proposing to sell the lots to multiple buyers, therefore, building types will be varied by each buyer. A condition at the time of building permits will ensure housing variety is met.

13. Unique and Integrated Design Elements. Great Neighborhoods have unique features, designs, and focal points to create neighborhood character and identity. Neighborhoods shall be encouraged to have:
- **a. Environmentally friendly construction techniques, green infrastructure systems, and energy efficiency incorporated into the built environment.**
- **b. Opportunities for public art provided in private and public spaces.**
- **c. Neighborhood elements and features including, but not limited to, signs, benches, park shelters, street lights, bike racks, banners, landscaping, paved surfaces, and fences, with a consistent and integrated design that are unique to and define the neighborhood. (Ord 5066 §2, April 9, 2019)**

FINDING: SATISFIED. The proposed infill development will have unique features, designs, and focal points to create neighborhood character and identity. As shown on the Grading Plan, the development utilizes green infrastructure system known as a bioswale to treat stormwater prior to entering the existing drainage way. Another unique feature will be the relocated and enhanced wetland that will be adjacent to the multiuse path connecting Fendle Way and Meadows. The proposed homes will all be constructed per the new building and energy codes, this will ensure energy efficiency into the built environment. The development does not preclude opportunities for public art provided in private and public spaces. As shown on the subdivision plan there are two benches located along the concrete multiuse path, with enhanced landscaping in the relocated wetland and the green stormwater system, a fence along the wetland and green stormwater system. All building permits for the future homes will also be subject to the new residential design standards, that will ensure unique and integrated design elements are included on each of the new homes. All these components provide a consistent and integrated design that are unique to define the neighborhood

Comprehensive Plan Map Amendment & Zone Change Information & Submittal Requirements

City Of McMinnville
Planning Department
231 NE Fifth Street ○ McMinnville, OR 97128
(503) 434-7311 Office ○ (503) 474-4955 Fax
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Overview

The comprehensive plan map describes the long-term direction and vision for the growth and development of our community. The zoning map describes the various zoning classifications for each parcel in McMinnville, as it exists today. Requests to amend either of these maps can be initiated by a property owner and are subject to review and approval by the McMinnville Planning Commission and City Council. Prior to submitting a request to amend either map, you are strongly encouraged to meet with Planning Department staff to discuss application and submittal requirements, scheduling, and the details of your proposal and its consistency with the McMinnville comprehensive plan. Further information regarding these processes can be found in Sections 17.72.120 (Applications – Public Hearings) to 17.72.0130 (Public Hearing Process) and 17.74.020 (Comprehensive Plan Map Amendment and Zone Change - Review Criteria) of the McMinnville Zoning Ordinance.

Application Submittal

The following materials must be provided at the time of submittal, or the application will not be accepted for processing.

- ☒ A completed Comprehensive Plan Map Amendment and/or Zone Change application form. If additional explanation or materials would assist or support the request, include them with the application form.
- ☒ A site plan (drawn to scale, with a north arrow, legible, and of a reproducible size), indicating existing and proposed features within and adjacent to the subject site, such as: access; lot and street lines with dimensions; distances from property lines to structures; improvements; and significant features (slope, vegetation, adjacent development, drainage, etc.). If of a larger size, provide five (5) copies in addition to **an electronic copy** with the submittal.
- ☒ A legal description of the subject site, preferably taken from the deed.
- ☒ Compliance of Neighborhood Meeting Requirements
- ☒ Payment of the applicable review fee.

Review Process

A request to amend the zoning map or comprehensive plan map is subject to review by the Planning Commission at a public hearing, who then forwards a recommendation to the City Council for their approval. In advance of the Commission hearing, notice is mailed to neighboring property owners advising them of the requested action and inviting their participation in the upcoming hearing. The process for providing notification and reviewing a request to amend the zoning map or comprehensive

plan map is outlined in Sections 17.72.120 (Applications-Public Hearings) and 17.72.130 (Public Hearing Process) of the Zoning Ordinance. While a complete application for a request to amend the zoning map must be submitted 35 (thirty-five) days prior to the date of the first public hearing, a request to amend the comprehensive plan map must be submitted 45 (forty-five) days prior to the date of the public hearing to ensure that notice of the application is provided to the Department of Land Conservation and Development, as required by State law.

The Planning Commission will use the following criteria in reaching a decision to approve, approve with conditions, or deny an application to amend the zoning map or comprehensive plan map.

A. The proposed amendment is consistent with the goals and policies of the Comprehensive Plan;

B. The proposed amendment is orderly and timely, considering the pattern of development in the area, surrounding land uses, and any changes which may have occurred in the neighborhood or community to warrant the proposed amendment; and

C. Utilities and services can be efficiently provided to serve the proposed uses or other potential uses in the proposed zoning district.

The Planning Commission will make a recommendation to the City Council to either approve or deny the request or approve the request in a different form. The City Council will either adopt an ordinance reflecting the proposed map amendment or zone change, or call for a public hearing.

The decision made by the Planning Commission may be appealed to the City Council as stated in Section 17.72.180 (Appeal from Ruling of Planning Commission) of the Zoning Ordinance. A decision of the City Council may be appealed to the Oregon Land Use Board of Appeals (LUBA), if filed in accordance with the requirements of State law.

Planning Department
231 NE Fifth Street ○ McMinnville, OR 97128
(503) 434-7311 Office ○ (503) 474-4955 Fax
www.mcminnvilleoregon.gov

Office Use Only:
File No.
Date Received
Fee
Receipt No.
Received by

Comprehensive Plan Map Amendment/ Zone Change Application

Applicant Information

Applicant is: ☒ Property Owner ☐ Contract Buyer ☐ Option Holder ☐ Agent ☐ Other

Applicant Name VJ2 Developers Phone 503.362.8232

Contact Name Don Jones Phone
(If different than above)

Address 695 Commercial Street

City, State, Zip Salem, OR 97301

Contact Email

Property Owner Information

Property Owner Name Phone
(If different than above)

Contact Name Phone

Address

City, State, Zip

Contact Email

Site Location and Description

(If metes and bounds description, indicate on separate sheet)

Note: See Attached for Site Location

Property Address 2280-2298 NW Fendle Way

Assessor Map No. R4 418 00204 - Total Site Area 4.977 AC

Subdivision Elysian Subdivision Block Lot

Comprehensive Plan Designation Residential Zoning Designation R-1

This request is for a:

☐ ***Comprehensive Plan Amendment*** ☒ ***Zone Change***

1. What, in detail, are you asking for? State the reason(s) for the request and the intended use(s) of the property.

The applicant is asking for a zone change from R-1 to R-3 in combination with a subdivision and planned development application. We are requesting the zone change from a R-1 to R-3 so that the proposed subdivision average lot size can be reduced from 9000 SF (R-1) to 6000SF.

2. Show in detail, by citing specific goals and policies, how your request is consistent with applicable goals and policies of the McMinnville Comprehensive Plan (Vol. 2).

SEE ATTACHED Written Narrative

3. If your request is subject to the provisions of a planned development overlay, show, in detail, how the request conforms to the requirements of the overlay.

SEE ATTACHED Written Narative

4. If you are requesting a Planned Development, state how the proposal deviates from the requirements of the Zoning Ordinance and give justification for such deviation.

SEE ATTACHED Written Narative

5. Considering the pattern of development in the area and surrounding land uses, show, in detail, how the proposed amendment is orderly and timely.

SEE ATTACHED Written Narative

6. Describe any changes in the neighborhood or surrounding area which might support or warrant the request.

SEE ATTACHED Written Narative

7. Document how the site can be efficiently provided with public utilities, including water, sewer, electricity, and natural gas, if needed, and that there is sufficient capacity to serve the proposed use.

SEE ATTACHED Written Narative

8. Describe, in detail, how the proposed use will affect traffic in the area. What is the expected trip generation?

SEE ATTACHED Written Narative

In addition to this completed application, the applicant must provide the following:

- ☒ *A site plan (drawn to scale, with a north arrow, legible, and of a reproducible size), indicating existing and proposed features within and adjacent to the subject site, such as: access; lot and street lines with dimensions; distances from property lines to structures; improvements; and significant features (slope, vegetation, adjacent development, drainage, etc.). If of a larger size, provide five (5) copies in addition to* ***an electronic copy*** *with the submittal.*
- ☒ *A legal description of the parcel(s), preferably taken from the deed.*
- ☒ Compliance of Neighborhood Meeting Requirements.
- ☒ *Payment of the applicable review fee, which can be found on the Planning Department web page.*

I certify the statements contained herein, along with the evidence submitted, are in all respects true and are correct to the best of my knowledge and belief.

VJ-7 Development, Inc
Willie Jones

Applicant's Signature

1/25/22

Date

Property Owner's Signature

Date

Planned Development
Information & Submittal Requirements

City Of McMinnville
Planning Department
231 NE Fifth Street ◦ McMinnville, OR 97128
(503) 434-7311 Office ◦ (503) 474-4955 Fax
www.mcminnvilleoregon.gov

Overview

A Planned Development is applied to property as a vehicle to encourage variety in the development pattern of the community; encourage mixed uses in a planned area; encourage developers to use a creative approach and apply new technology in land development; preserve significant man-made and natural features; facilitate a desirable aesthetic and efficient use of open space; and create public and private open spaces. A Planned Development is not intended as a guise to circumvent the intent of the Zoning Ordinance. Once adopted and applied to a property, the Planned Development -- in concert with the Zoning Ordinance -- guides development within the subject property.

Application Submittal

The following materials must be provided at the time of submittal, or the application will not be accepted for processing.

- ☐ A completed Planned Development application form. If additional explanation or materials would assist or support the request, please include them with the application form.
- ☐ A site plan (drawn to scale, with a north direction arrow, legible, and of a reproducible size), indicating existing and proposed features such as: access; lot and street lines with dimensions in feet; distances from property lines; improvements; and significant features (slope, vegetation, adjacent development, drainage, etc.).
- ☐ A legal description of the subject site, preferably taken from the deed.
- ☐ Compliance of Neighborhood Meeting Requirements.
- ☐ Payment of the applicable review fee.

Review Process

Upon receipt of a complete application for a Planned Development, the Planning Department will schedule a date and time for the Planning Commission's public hearing on the request, and provide notification of the proposed Planned Development to property owners within 300 feet of the subject site. The Planning Commission's public hearing will follow the procedures as stated in Sections 17.72.120 (Applications – Public Hearings) and 17.72.130 (Public Hearing Process) of the Zoning Ordinance.

Approval of a Planned Development requires that the applicant demonstrate that the following criteria, as stated in Section 17.74.070 (Planned Development Amendment – Review Criteria) of the Zoning Ordinance have been met:

A. There are special physical conditions or objectives of a development which the proposal will satisfy to warrant a departure from the standard regulation requirements;

B. Resulting development will not be inconsistent with the Comprehensive Plan objectives of the area;

C. The development shall be designed so as to provide for adequate access to, and efficient provision of, services to adjoining parcels;

D. The plan can be completed within a reasonable period of time;

E. The streets are adequate to support the anticipated traffic, and the development will not overload the streets outside the planned area;

F. Proposed utility and drainage facilities are adequate for the population densities and type of development proposed;

G. The noise, air, and water pollutants caused by the development do not have an adverse effect upon surrounding areas, public utilities, or the city as a whole.

Following the close of the hearing, the Commission will vote to forward a recommendation to the City Council to approve the requested Planned Development, or approve it with a different form. If the Commission recommends the request be denied, no further proceedings shall be held, unless an appeal of the Commission's decision is filed, as stated in Section 17.72.180 (Appeal from Ruling of Planning Commission) of the Zoning Ordinance.

Upon receipt of the decision of the Planning Commission to recommend approval the Council shall:

A. Based on the material in the record and the findings adopted by the Commission and transmitted to the City Council, adopt an ordinance effecting the proposed change, or;

B. Call for a public hearing on the proposal subject to the notice requirements stated in Section 17.72.120(D-F) (Applications – Public Hearings) of the Zoning Ordinance.

City Of McMinnville

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Planned Development Application

Applicant Information

Applicant is: ☐ Property Owner ☐ Contract Buyer ☐ Option Holder ☐ Agent ☐ Other_____

Applicant Name VJ2 Developers Phone 503-362-8232

Contact Name Don Jones Phone_____
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Address 695 Commercial Street

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Contact Email_____

Property Owner Information

Property Owner Name_____ Phone_____
(If different than above)

Contact Name_____ Phone_____

Address_____

City, State, Zip_____

Contact Email_____

Site Location and Description

(If metes and bounds description, indicate on separate sheet)

Property Address 2280-2298 NW Fendle Way

Assessor Map No. R4 418 00204 Total Site Area 3.79 AC

Subdivision Elysian Subdivision Block_____ Lot_____

Comprehensive Plan Designation Residential Zoning Designation R-1

1. Show in detail your request for a Planned Development. State the reason(s) for the request and the intended use(s) of the property:

The reason that a 5 FT setback for sideyards is proposed is to comform to similar planned developments in the area and to maximize building footprint area. The proposed use of the property is to be Low-Density Residential (R-1).

2. Describe the specific regulations this proposal wishes to modify (e.g., setbacks, density) and how the physical site conditions or objectives of the proposed development warrant a departure from those regulations:

The proposed planned development is requesting to modify the 10 FT setback per Chapter 17.12 Section 040 of the McMinnville Municipal Code for side yards to a 5FT setback from the property line to the edge of the building.

The proposed planned development is requesting to modify the minimum lot size standards of the R-1 zone from 9,000 square feet to 5,436 square feet.

3. Show in detail, by citing specific goals and policies, how your request is consistent with applicable goals and policies of the McMinnville Comprehensive Plan (Volume II):

See attached writeup.

4. Considering the pattern of development in the area and surrounding land uses, show, in detail, how the proposal is orderly and timely:

The proposed planned development is bordered on all sides by areas zoned as Residential (R-1). The property located to the west of the project site is zoned as Residential (R-1) and currently serves as a community park. See attached writeup for how the proposed planned development is consistent with the goals and policies of the City of McMinnville Comprehensive Plan (Volume II).

5. Describe any changes in the neighborhood or surrounding area which might support or warrant the request:

The surrounding planned developments ranges from 3-5 FT side yard setbacks. The proposed planned development will be consistent with the surrounding developments.

6. Document how the site can be efficiently provided with public utilities, including water, sewer, electricity, and natural gas, if needed, and that there is sufficient capacity to serve the proposed use:

See attached for the utilities plan.

7. Describe, in detail, how the proposed use will affect traffic in the area. What is the expected trip generation?

The proposed use is in accordance with the current zoning. The planned development proposes to connect the north and south dead ends of NW Meadows Drive. Therefore, this project will benefit traffic flow in the area and not have a negative impact.

The expected trip generation for this site is 7 trips per household, totaling to 126 trips for the 18-lot subdivision.

In addition to this completed application, the applicant must provide the following:

- ☐ *A site plan (drawn to scale, legible, and of a reproducible size) indicating existing and proposed features such as: access; lot and street lines with dimensions in feet; distances from property lines; improvements; north direction arrow, and significant features (slope, vegetation, adjacent development, drainage, etc.).*
- ☐ *A legal description of the subject site, preferably taken from the deed.*
- ☐ Compliance of Neighborhood Meeting Requirements.
- ☐ *Payment of the applicable review fee, which can be found on the Planning Department web page.*

I certify the statements contained herein, along with the evidence submitted, are in all respects true and are correct to the best of my knowledge and belief.

Applicant's Signature — Date: 8/21/20

Property Owner's Signature — Date

Amended – Applicants Written Findings

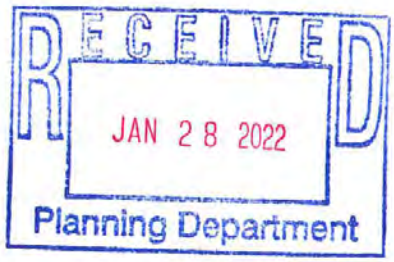
Great Neighborhood Principles, Planned Development, Comp Plan Volume II Goals and Policy, and Zone Change Findings

Request:

The applicant is requesting for a phased 18 lot Subdivision, with a Planned Development Overlay adjusting the zone side yard setbacks from 7 to 5 feet, and Zone Change Application (R-1 to R-3), which will allow an average lot size to be reduced from 9000 SF to 6000 SF. The applicant and City of McMinnville are currently in the DSL/ACOE wetland fill process and are now to the point that land use approval is required prior to wetland fill approval. The reason this is a joint (City and applicant) fill application is because a portion of the wetlands are located on the City parks property that will be dedicated to allow the construction of NW Meadows Drive.

List of Exhibits:

- Civil Drawings
  - Existing Conditions Plan
  - Subdivision Plan
  - Overall Utility Plan
  - Grading & Drainage Plan
  - Street & Storm Drain Plan and Profiles
  - Sanitary Sewer Plan & Profiles
  - Water Plans
- Revised Drainage Rehabilitation Plan (Terra Science)



Below are the required sections that must be addressed in order to obtain an approved Development Application. The relevant code sections are followed by the applicant's response in *italics.*

McMinnville Comprehensive Plan Vol. 2 – Great Neighborhood Principles:

Policies:

187.10

The City of McMinnville shall establish Great Neighborhood Principles to guide the land use patterns, design, and development of the places that McMinnville VOLUME II Goals and Policies Page 70 citizens live, work, and play. The Great Neighborhood Principles will ensure that all developed places include characteristics and elements that create a livable, egalitarian,

healthy, social, inclusive, safe, and vibrant neighborhood with enduring value, whether that place is a completely new development or a redevelopment or infill project within an existing built area.

Applicant's response: The proposed subdivision is in accordance with the purpose of Policy 187.10 by creating a livable subdivision next to a city park. The project is an infill development with all infrastructure to be built per city standards with characteristics that create an egalitarian and vibrant neighborhood with enduring value. The project provides pedestrian access next to a city park to create a social, inclusive and safe neighborhood.

187.20

The Great Neighborhood Principles shall encompass a wide range of characteristics and elements, but those characteristics and elements will not function independently. The Great Neighborhood Principles shall be applied together as an integrated and assembled approach to neighborhood design and development to create a livable, egalitarian, healthy, social, inclusive, safe, and vibrant neighborhood, and to create a neighborhood that supports today's technology and infrastructure, and can accommodate future technology and infrastructure.

Applicant's response: The proposed subdivision has applied the Great Neighborhood Principle together in the neighborhood design and development to create a livable, egalitarian, healthy, social, inclusive, safe, and vibrant neighborhood, and to create a neighborhood that supports today's technology and infrastructure, and can accommodate future technology and infrastructure. In addition, the infill development is located next to a city park with pedestrian access to apply the Great Neighborhood Principles.

187.30

The Great Neighborhood Principles shall be applied in all areas of the city to ensure equitable access to a livable, egalitarian, healthy, social, inclusive, safe, and vibrant neighborhood for all McMinnville citizens.

Applicant's response: The proposed infill development ensures equitable access to a livable, egalitarian, healthy, social, inclusive, safe, and vibrant neighborhood for all McMinnville citizens by providing pedestrian access to the nearby city park and sidewalks throughout the development.

187.40

The Great Neighborhood Principles shall guide long range planning efforts including, but not limited to, master plans, small area plans, and annexation requests. The Great Neighborhood Principles shall also guide applicable current land use and development applications.

Applicant's response: The proposed subdivision is in accordance with the City of McMinnville Master Plan by using the Great Neighborhood Principles to guide the design and construction of the infill development.

187.50

The McMinnville Great Neighborhood Principles are provided below. Each Great Neighborhood Principle is identified by number below (numbers 1 – 13), and is followed by more specific direction on how to achieve each individual principle.

1. Natural Feature Preservation. Great Neighborhoods are sensitive to the natural conditions and features of the land.
    a. Neighborhoods shall be designed to preserve significant natural features including, but not limited to, watercourses, sensitive lands, steep slopes, wetlands, wooded areas, and landmark trees.
2. Scenic Views. Great Neighborhoods preserve scenic views in areas that everyone can access.
    a. Public and private open spaces and streets shall be located and oriented to capture and preserve scenic views, including, but not limited to, views of significant natural features, landscapes, vistas, skylines, and other important features.
3. Parks and Open Spaces. Great Neighborhoods have open and recreational spaces to walk, play, gather, and commune as a neighborhood.
    a. Parks, trails, and open spaces shall be provided at a size and scale that is variable based on the size of the proposed development and the number of VOLUME II Goals and Policies Page 71 dwelling units.
    b. Central parks and plazas shall be used to create public gathering spaces where appropriate.
    c. Neighborhood and community parks shall be developed in appropriate locations consistent with the policies in the Parks Master Plan.
4. Pedestrian Friendly. Great Neighborhoods are pedestrian friendly for people of all ages and abilities.
    a. Neighborhoods shall include a pedestrian network that provides for a safe and enjoyable pedestrian experience, and that encourages walking for a variety of reasons including, but not limited to, health, transportation, recreation, and social interaction.
    b. Pedestrian connections shall be provided to commercial areas, schools, community facilities, parks, trails, and open spaces, and shall also be provided between streets that are disconnected (such as cul-de-sacs or blocks with lengths greater than 400 feet).
5. Bike Friendly. Great Neighborhoods are bike friendly for people of all ages and abilities.
    a. Neighborhoods shall include a bike network that provides for a safe and enjoyable biking experience, and that encourages an increased use of bikes by people of all abilities for a variety of reasons, including, but not limited to, health, transportation, and recreation.
    b. Bike connections shall be provided to commercial areas, schools, community facilities, parks, trails, and open spaces.
6. Connected Streets. Great Neighborhoods have interconnected streets that provide safe travel route options, increased connectivity between places and destinations, and easy pedestrian and bike use.
    a. Streets shall be designed to function and connect with the surrounding built environment and the existing and future street network, and shall incorporate human scale elements including, but not limited to, Complete Streets features as defined in the Comprehensive Plan, grid street networks, neighborhood traffic management techniques, traffic calming, and safety enhancements.

b. Streets shall be designed to encourage more bicycle, pedestrian and transit mobility with a goal of less reliance on vehicular mobility. VOLUME II Goals and Policies Page 72

7. Accessibility. Great Neighborhoods are designed to be accessible and allow for ease of use for people of all ages and abilities.
   a. To the best extent possible all features within a neighborhood shall be designed to be accessible and feature elements and principles of Universal Design.
   b. Design practices should strive for best practices and not minimum practices.
8. Human Scale Design. Great Neighborhoods have buildings and spaces that are designed to be comfortable at a human scale and that foster human interaction within the built environment.
   a. The size, form, and proportionality of development is designed to function and be balanced with the existing built environment.
   b. Buildings include design elements that promote inclusion and interaction with the right-of-way and public spaces, including, but not limited to, building orientation towards the street or a public space and placement of vehicle oriented uses in less prominent locations.
   c. Public spaces include design elements that promote comfortability and ease of use at a human scale, including, but not limited to, street trees, landscaping, lighted public areas, and principles of Crime Prevention through Environmental Design (CPTED).
9. Mix of Activities. Great Neighborhoods provide easy and convenient access to many of the destinations, activities, and local services that residents use on a daily basis.
   a. Neighborhood destinations including, but not limited to, neighborhood serving commercial uses, schools, parks, and other community services, shall be provided in locations that are easily accessible to surrounding residential uses.
   b. Neighborhood-serving commercial uses are integrated into the built environment at a scale that is appropriate with the surrounding area.
   c. Neighborhoods are designed such that owning a vehicle can be optional.
10. Urban-Rural Interface. Great Neighborhoods complement adjacent rural areas and transition between urban and rural uses.
    a. Buffers or transitions in the scale of uses, buildings, or lots shall be provided on urban lands adjacent to rural lands to ensure compatibility.
11. Housing for Diverse Incomes and Generations. Great Neighborhoods provide housing opportunities for people and families with a wide range of incomes, and VOLUME II Goals and Policies Page 73 for people and families in all stages of life.
    a. A range of housing forms and types shall be provided and integrated into neighborhoods to provide for housing choice at different income levels and for different generations.
12. Housing Variety. Great Neighborhoods have a variety of building forms and architectural variety to avoid monoculture design.
    a. Neighborhoods shall have several different housing types.
    b. Similar housing types, when immediately adjacent to one another, shall provide variety in building form and design.
13. Unique and Integrated Design Elements. Great Neighborhoods have unique features, designs, and focal points to create neighborhood character and identity. Neighborhoods shall be encouraged to have:

a. Environmentally friendly construction techniques, green infrastructure systems, and energy efficiency incorporated into the built environment.
b. Opportunities for public art provided in private and public spaces.
c. Neighborhood elements and features including, but not limited to, signs, benches, park shelters, street lights, bike racks, banners, landscaping, paved surfaces, and fences, with a consistent and integrated design that are unique to and define the neighborhood. (Ord 5066 §2, April 9, 2019)

Applicant's response:

(1.) The proposed subdivision is proposing to relocate the man made ditches and wetlands associated with the construction of the Shadden Claim development. A portion of the existing man made wetlands will be preserved and enhanced along the southern section of the development (refer to the Drainage Rehabilitation Plan). The existing man made ditch and associated wetlands are proposed to be filled in order to connect Meadows Drive and provide lots along the street to border the neighborhood park, while the wetlands along the southern boundary of the subject property are proposed to be enhanced. The enchanced drainage ditch allows drainage from the parks property to the west to match the existing flow path to the east, connecting to the existing ditch. The existing ditch/wetlands will be enhanced with landscaping as shown the wetland-fill landscape restoration plan (refer to the Drainage Rehabilitation Plan). Therefore, the intent of the principle has been met.

(2.) The proposed subdivision is located near a park and provides approximately 15,086 square feet of open space to preserve the scenic views that currently exist.

(3.) The proposed subdivision is located across the street from the Jay Pearson Neighborhood Park. In addition, a public access is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park.

(4.) Sidewalks are proposed along the Meadows Drive connection as well as the proposed cul-de-sac extension of NW Fendle Way. In addition, a 10ft wide multiuse public access sidewalk is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park.

(5.) The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. Per the TSP a local street and minor collectors have shared street access with bikes and vehicle's. In addition, a 10ft wide concrete multiuse path is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. Therefore, the development is bike friendly and provides bike connections to the surrounding neighborhood.

(6.) The proposed subdivision will connect the north and south dead-end street of Meadows Drive and extend Fendle Way to terminate in a cul-de-sac. The proposed development will also be constructed with sidewalks and a multiuse path to connect NW Fendle Way and Meadows Drive. This connection will provide multiuse access from the neighborhood to the city park located west of the subdivision.

(7.) The proposed subdivision street, sidewalk and pedestrian access grades are relatively flat and will be designed to meet all public works design standards and ADA Standards. Therefore, the development will allow ease of use people with all ages. Except for the proposed wetlands that are being preserved, all of the proposed development is proposed to be designed.

(8.) The proposed development is an infill development. The proposed lots will face either the extension of Fendle Way or the connection of Meadows Drive or a public use area. The building will have garages so the vehicles could be stored out of view. The allowable building sizes based on the setbacks will balance with the proposed street extensions and be compatible with the surrounding neighborhood. Meadows Drive and Fendle Way will all have landscaping, street lights, street trees to promote a comfortable and ease of use throughout the built environment. In addition, the10ft wide multiuse path to connect the public built environment of Fendle Way and NW Meadows Drive that provide a greater ease of use of the built environment. These design elements promote comfort, ease of use and the principles of Crime Prevention through Environmental Design.

(9.) The proposed subdivision provides public access along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. This connection will provide efficient pedestrian access that allows for owning a vehicle to be optional.

(10.) The proposed subdivision is designed in accordance to blend with the surrounding neighborhood with lot sizes and building design that is consistent with the existing surrounding neighborhood.

(11.) The proposed development provides housing for diverse incomes and different generations by the combination of varying lots sizes, rezoning from R-1 to R-3 and HB 2001. As shown on the subdivision plan the lot sizes vary from 5436 SF to 8363 SF, which would not be allowed under current zoning. In addition, the R-3 zone allows dual family living in addition to single family dwelling. This coupled with HB 2001, which allows multifamily development on single family residential zoned property creates the option for numerous housing types for diverse incomes spanning different generations.

(12.) The applicant is proposing to sell the lots to multiple buyers, therefore, building types will be varied by each buyer. This can be ensured with a condition of approval.

(13.) The proposed infill development will have unique features, designs, and focal points to create neighborhood character and identity. As shown on the Grading Plan, the development utilizes green infrastructure system known as a bioswale to treat stormwater prior to entering the existing drainage way. Another unique feature will be the relocated and enhanced wetland (Refer to the Drainage Rehabilitation Plan) that will be adjacent to the multiuse path connecting Fendle Way and Meadows. The proposed homes will all be required to be constructed per the new building and energy codes, this will ensure energy efficiency into the built environment. The development does not preclude opportunities for public art provided in private and public spaces. This can be ensured by a condition of approval that the City has to review and approve the HOA governing documents to ensure public art is not excluded. As shown on the subdivision plan there are two benches located along the concrete multiuse path, with enhanced landscaping in the relocated wetland and the green stormwater system, a fence along the wetland and green stormwater system. All

these components provide a consistent and integrated design that are unique to define the neighborhood.

Planned Development – Chapter 17.51:

17.51.010 – Purpose

The purpose of a planned development is to provide greater flexibility and greater freedom of design in the development of land than may be possible under strict interpretation of the provisions of the zoning ordinance. Further, the purpose of a planned development is to encourage a variety in the development pattern of the community; encourage mixed uses in a planned area; encourage developers to use a creative approach and apply new technology in land development; preserve significant man-made and natural features; facilitate a desirable aesthetic and efficient use of open space; and create public and private common open spaces. A planned development is not intended to be simply a guise to circumvent the intent of the zoning ordinance. Such plan should accomplish substantially the same general objectives as proposed by the comprehensive plan and zoning ordinance for the area;

Applicant's response: There are many special objectives of the development of the subject properties the Applicant is attempting to achieve with the application for the proposed planned development overlay.

(1) Provide a diversity of lot sizes that will contribute to variety in the development pattern of the community housing, and varied housing sizes and styles, which will correlate to various price points to meet today's market need of home consumers in McMinnville. The applicant is proposing meet this special objective with a concurrent zone change from R-1 to R-3 to provide lot sizes ranging from rezoning from 5436 SF to 8363 SF and reduced side yard setbacks from 7ft to 5ft, which would not be allowed under current zoning. In addition, the R-3 zone allows dual family living in addition to single family dwelling. This coupled with HB 2001, which allows multifamily development on single family residential zoned property creates the option for numerous housing types for diverse incomes spanning different generations. The applicant is proposing to sell the lots to several different builders to further provide variety in the development pattern.

(2) Meet a desire to preserve and enhance the manmade features to create desirable aesthetic and efficient use of public open spaces. The applicant proposes to meet this important objective by enhancing the manmade drainage way along the southern property boundary by expanding it and landscaping the existing drainage ditch to provide aesthetically pleasing open area (Refer to the Drainage Rehabilitation Plan). Adjacent to this open area will be a 10ft wide multipurpose access way with benches that can be utilized by the public. This open area will enhance the existing manmade features providing and aesthetically pleasing open area that is also an efficient use of public open spaces.

17.51.020 Standards and requirements.

The following standards and requirements shall govern the application of a planned development in a zone in which it is permitted:

A. The principal use of land in a planned development shall reflect the type of use indicated on the comprehensive plan or zoning map for the area. Accessory uses within the development may include uses permitted in any zone, except uses permitted only in the M-2 zone are excluded from all other zones. Accessory uses shall not occupy more than twenty-five percent of the lot area of the principal use;

Applicant's response: The subject property has a residential designation on the comprehensive plan. The proposed development is a residential development, therefore this objective has been met.

B. Density for residential planned development shall be determined by the underlying zone designations. (Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).

The proposed development with concurrent zone change to R-3, subdivision and PD, the proposed lot size ranges in size from 5,436 SF to 8,363 SF, and lot density of 4.8 dwelling units/acre. The proposed density can be met with the approval of the concurrent application. This Policy can be met and can be ensured by conditions of approval for the concurrent zone change, PD and subdivision applications.

17.51.030 (C.) – Procedure

C. The Commission shall consider the preliminary development plan at a meeting at which time the findings of persons reviewing the proposal shall also be considered. In reviewing the plan, the Commission shall need to determine that:

1. There are special physical conditions or objectives of a development which the proposal will satisfy to warrant a departure from the standard regulation requirements;

Applicant's response: There are special physical conditions and objectives of the development of the subject property the Applicant is attempting to achieve with the application for the proposed planned development overlay.

Special Physical Conditions (1) The special physical conditions of the site include the infill nature of the development (surrounded by residential development with a neighborhood park to the west) and the manmade drainages onsite limit the configurations of development. In addition, the manmade wetlands under the Meadows Drive connection and along the phase line are proposed to be filled. However, the applicant is proposing to enhance the manmade wetland ditch along the south property line to ensure proper drainage, and provide enhanced physical conditions of the site. The special conditions warrant deviation of the standard requirements.

Objective (1) Provide a diversity of lot sizes and setback flexibility that will contribute to variety in the development pattern of the community housing, and varied housing sizes and styles. The applicant is also proposing a concurrent zone change from R-1 to R-3 to provide lot sizes ranging from rezoning from 5436 SF to 8363 SF and reduced side yard setbacks from 7ft to 5ft, which would not be allowed with a Planned Development Overlay and/or Zone Change. The applicant is proposing to sell the lots to several different builders to further provide variety in housing types and styles to home consumers in McMinnville. The reduced side yard setback provides the builders more flexibility in housing types and styles.

2. Resulting development will not be inconsistent with the Comprehensive Plan objectives of the area;

Applicant's response: Please refer to the applicant's response to the Comprehensive Plan objectives below. The application is consistent with the Comprehensive Plan.

3. The development shall be designed so as to provide for adequate access to and efficient provision of services to adjoining parcels;

Applicant's response: The proposed development is an infill development. The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. In addition, a 10ft wide concrete multiuse path is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. Therefore, access to the existing surrounding streets will provide efficient access to services to adjoining parcels.

4. The plan can be completed within a reasonable period of time;

Applicant's response: The applicant is proposing to construct the improvements in the summer of 2022 for lots to be sold in the fall and winter of 2022. This development is typical in the industry. Therefore, this objective has been met.

5. The streets are adequate to support the anticipated traffic, and the development will not overload the streets outside the planned area;

Applicant's response: The proposed development is an infill development. The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. In addition, a 10ft wide concrete multiuse path. The density of units is consistent with the City's TSP and therefore will not overload the streets outside the planned area.

6. Proposed utility and drainage facilities are adequate for the population densities and type of development proposed;

Applicant's response: Refer to the civil plans. As shown the civil plans, the applicant is proposing to extend existing sewer and water systems to service the development. The proposed density (4.8 units/acre) is less than the 6 units/acre utilized in the City Sanitary Sewer Conveyance System Master Plan to size the sewer mains. The applicant is proposing to provide stormwater detention in accordance with the City's Storm Drainage Master Plan, which accounts for lot density. All utility design will be in accordance with City standards. Therefore this standard is met.

7. The noise, air, and water pollutants caused by the development do not have an adverse effect upon surrounding areas, public utilities, or the city as a whole;

Applicant's response: The proposed development will not create a land use that will cause noise incompatibility with surrounding uses. The proposed development will not facilitate any use generating major air emissions beyond what is expected for residential development. The proposed development plans to capture, detain and treat stormwater runoff in a combination swale and detention facility, therefore typical stormwater pollutants and will not have an adverse affect on surrounding areas. The public utilities are all sized to be consistent with the City's Sewer Conveyance and Storm Drainage Master Plans, and therefore will not have an adverse effect on public utilities or the City as a whole.

Comprehensive Plan Volume II Goals & Policies

GOAL V 2: TO PROMOTE A RESIDENTIAL DEVELOPMENT PATTERN THAT IS LAND INTENSIVE AND ENERGY-EFFICIENT, THAT PROVIDES FOR AN URBAN LEVEL OF PUBLIC AND PRIVATE SERVICES, AND THAT ALLOWS UNIQUE AND INNOVATIVE DEVELOPMENT TECHNIQUES TO BE EMPLOYED IN RESIDENTIAL DESIGNS.

Policies:

68.00 The City of McMinnville shall encourage a compact form of urban development by directing residential growth close to the city center, to designated neighborhood activity centers, and to those areas where urban services are already available before committing alternate areas to residential use. (Ord. 5098, December 8, 2020)

Applicant's response: The proposed development is an infill development located within and existing neighborhood, where urban services such as parks (across the street), connecting streets (Meadows Lane and Fendle Way), sewer, water and drainage are all available to service the proposed development.

69.00 The City of McMinnville shall explore the utilization of innovative land use regulatory ordinances which seek to integrate the functions of housing, commercial, and industrial developments into a compatible framework within the city.

Applicant's response: The existing property is zoned residential and is within and compliant with the existing land use regulatory ordinances.

70.00 The City of McMinnville shall continue to update zoning and subdivision ordinances to include innovative land development techniques and incentives that provide for a variety of housing types, densities, and price ranges that will adequately meet the present and future needs of the community.

Applicant's response: The City has updated zoning and subdivision ordinances including the Great Neighborhood Principles, allows PD's which vary lot size and provide different housing types, densities and corresponding price ranges, such as the proposed development.

71.00 The City of McMinnville shall designate specific lands inside the urban growth boundary as residential to meet future projected housing needs. Lands so designated may be developed for a variety of housing types. All residential zoning classifications shall be allowed in areas designated as residential on the Comprehensive Plan Map.

Applicant's response: The proposal is allowed within the residential designation of on the Comprehensive Plan and will provide land intensive, energy efficient housing types.

71.05 The City of McMinnville shall encourage annexations and rezoning which are consistent with the policies of the Comprehensive Plan so as to achieve a continuous five-year supply of

buildable land planned and zoned for all needed housing types. (Ord.4840, January 11, 2006; Ord. 4243, April 5, 1983; Ord. 4218, November 23, 1982)

Applicant's response: The proposed development is consistent with the policies of the Comprehensive Plan. The proposed development proposes to increase the density to provide a supply of several different types of needed housing.

71.09 Medium and High-Density Residential (R-3 and R-4) - The majority of residential lands in McMinnville are planned to develop at medium density range (4 – 8 dwelling units per net acre). Medium density residential development uses include small lot single-family detached uses, single family attached units, duplexes and triplexes, and townhouses. High density residential development (8 – 30 dwelling units per net acre) uses typically include townhouses, condominiums, and apartments:

Applicant's response: The proposal proposes to develop the residential land at 4.8 dwelling units/acre with the proposed R-1 to R-3 zone change, therefore we are proposing to develop on the low end of the medium density range which is consistent with the standard.

1. Areas that are not committed to low density development;

Applicant's response: The proposed development is not located on residential ground committed to low density development.

2. Areas that have direct access from collector or arterial streets; or a local collector street within 600' of a collector or arterial street;

Applicant's response: The proposed development is located adjacent a collector (NW Meadows Drive).

3. Areas that are not subject to development limitations such as topography, flooding, or poor drainage;

Applicant's response: The site is relatively flat (refer to the Existing Conditions Plan and Grading and Drainage Plans) and is not located within a mapped flood plain. The applicant is proposing to enhance the wetlands onsite and provide drainage improvements. Therefore this policy is met.

4. Areas where the existing facilities have the capacity for additional development;

Applicant's response: The proposed development is an infill development consistent with surrounding landuse density, adjacent a public park, a minor collector, and a local street, and will meet the City Facilities Plan, TSP and Drainage Master Plan for development.

5. Areas within one-quarter mile of existing or planned public transportation.

Applicant's response: There is public transportation located along Baker Creek Road. The proposed project is 755 ft from Baker Creek Road with is within ¼ mile of the existing public transportation.

Planned Development Policies:

72.00 Planned developments shall be encouraged as a favored form of residential development as long as social, economic, and environmental savings will accrue to the residents of the development and the city.

Applicant's response: The proposal is for the purpose of providing for cost effective and efficient single family detached units. The residents of the proposed Planned Development have ready access to a designated neighborhood park, within a ¼ mile of an existing private golf course, and adjacent to Rehabilitated Drainage. The proposal will allow the construction of a Planned Development that will provide for a variety of homes with a variety of housing costs to the citizens of McMinnville. This Policy has been met.

73.00 Planned residential developments which offer a variety and mix of housing types and prices shall be encouraged.

Applicant's response: The proposal will provide for single family residential homes on individual lots of various sizes, ranging from 5,436 SF to 8,363 SF. It will provide for homes that will be affordable to the residents of the City with moderate incomes. This Policy has been met.

74.00 Distinctive natural, topographic, and aesthetic features within planned developments shall be retained in all development designs.

Applicant's response: As shown on the survey there are a couple of man made drainage ditches that were intended to be temporary with the Shadden Claim development to the north. There are two ditches, one that drains the park and the other that drains Meadows Drive. These ditches are considered wetlands by the most recent standards. We are proposing to fill the drainage ditch under Meadows Drive and widen and enhance the existing drainage ditch/wetlands that drains the park and flows along the southern property boundary. This ditch is proposed to be retained and enhanced, therefore this policy has been met.

75.00 Common open space in residential planned developments shall be designed to directly benefit the future residents of the developments. When the open space is not dedicated to or accepted by the City, a mechanism such as a homeowners association, assessment district, or escrow fund will be required to maintain the common area. VOLUME II Goals and Policies Page 26.

Applicant's response: The dedicated open space is proposed to be owned by a homeowners association and will thereby benefit the future residents of the development. This can be ensured by a condition of approval.

76.00 Parks, recreation facilities, and community centers within planned developments shall be located in areas readily accessible to all occupants.

Applicant's response: The open space and associated multiuse path with benches is connected to all lots of the proposed development by a sidewalk in accordance with ADA standards and therefore is readily accessible to all applicants.

77.00 The internal traffic system in planned developments shall be designed to promote safe and efficient traffic flow and give full consideration to providing pedestrian and bicycle pathways.

Applicant's response: The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. Per the TSP a local street and minor collectors have shared street access with bikes and vehicle's. In addition, a 10ft wide concrete multiuse path is proposed along the 15,086 square feet of open space to connect the cul-de-sac to Meadows Drive which will border the east side of Jay Pearson Neighborhood Park. Therefore, the development has given full consideration to providing pedestrian and bicycle pathways.

78.00 Traffic systems within planned developments shall be designed

Applicant's response: The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. These streets are proposed to be designed to meet the City design standards, TSP and prepared by a licensed civil engineer. Therefore this policy is met.

Residential Design Policies:

79.00 The density allowed for residential developments shall be contingent on the zoning classification, the topographical features of the property, and the capacities and availability of public services including but not limited to sewer and water. Where densities are determined to be less than that allowed under the zoning classification, the allowed density shall be set through adopted clear and objective code standards enumerating the reason for the limitations, or shall be applied to the specific area through a planned development overlay. Densities greater than those allowed by the zoning classification may be allowed through the planned development process or where specifically provided in the zoning ordinance or by plan policy. (Ord. 4796, October 14, 2003)

Applicant's response: The proposed development with concurrent zone change to R-3, subdivision and PD, the lot size ranges in size from 5,436 SF to 8,363 SF, and lot density of 4.8 dwelling units/acre. The proposed density can be met with the approval of the concurrent application. This Policy can be met and can be ensured by conditions of approval for the concurrent zone change, PD and subdivision applications.

80.00 In proposed residential developments, distinctive or unique natural features such as wooded areas, isolated preservable trees, and drainage swales shall be preserved wherever feasible.

Applicant's response: As shown on the survey there are a couple of man made drainage ditches that were intended to be temporary with the Shadden Claim development to the north. There are two ditches, one that drains the park and the other that drains Meadows Drive. These ditches are considered wetlands by the most recent standards. We are proposing to fill the drainage ditch under Meadows Drive and widen and enhance the existing drainage ditch/wetlands that drains the park and flows along the southern property boundary. This ditch is proposed to be retained and enhanced (Refer to the Drainage Rehabilitation Plan), therefore this policy has been met.

81.00 Residential designs which incorporate pedestrian and bikeway paths to connect with activity areas such as schools, commercial facilities, parks, and other residential areas, shall be encouraged.

Applicant's response: The concurrent proposed Zone Change/PD/Subdivision will provide necessary street improvements including the provision of curbs, gutter, sidewalks and planter strips on all of the streets within the proposed development. The necessary linkage for pedestrians in this area to the school property, park, commercial area and the private open spaces has been met.

82.00 The layout of streets in residential areas shall be designed in a manner that preserves the development potential of adjacent properties if such properties are recognized for development on the McMinnville Comprehensive Plan Map.

Applicant's response: The proposed development is an infill development and the adjacent properties are already developed, therefore this policy is met.

83.00 The City of McMinnville shall review the design of residential developments to insure site orientation that preserves the potential for future utilization of solar energy.

Applicant's response: The lots have been as detached dwelling units, therefore they can have windows on all four sides of each building allowing for solar passive gains. Upon development of the lots the contactor could install solar panel on structures, but is not included in this proposal. This policy has been met.

Zone Change Criteria:

A. The proposed amendment is consistent with the goals and policies of the Comprehensive Plan
Applicant's response: Please refer to the Comprehensive plan goals and policies written findings above.

B. The proposed amendment is orderly and timely, considering the pattern of development in the area, surrounding land uses, and any changes with may have occurred in the neighborhood of community to warrant the proposed amendment.
Applicant's response: The proposed development is an infill development that proposes to connect existing streets and extend existing streets and provide pedestrian and bike access between both new public streets. The applicant is proposing to construct the improvements in the summer of 2022 for lots to be sold in the fall and winter of 2022. Therefore, the amendment is orderly and timely. In the last couple years the surrounding area has developed as a medium density neighborhood (Baker Creek West Subdivision). The proposed lot density is similar to the surrounding area. The applicant is proposing to provide a medium density neighborhood with a variety of lot sizes, therefore this criteria has been meet.

C. Utilities and services can be efficiently provided to serve the proposed uses or other potential uses in the proposed zoning district.

Applicant's response: Refer to the civil plans. The applicant is proposing to extend Fendle Way (a local street) and terminate it in a cul-de-sac. In addition, the applicant is proposing to connect Meadows Drive (a minor collector) and match the existing street width of the existing portion, north and south. In addition, a 10ft wide concrete multiuse path. The density of units is consistent with the City's TSP and therefore will not overload the streets outside the planned area.

As shown the civil plans, the applicant is proposing to extend existing sewer and water systems to service the development. The proposed density (4.8 units/acre) is less than the 6 units/acre utilized in the City Sanitary Sewer Conveyance System Master Plan to size the sewer mains. The applicant is proposing to provide stormwater detention in accordance with the City's Storm Drainage Master Plan, which accounts for lot density. All utility design will be in accordance with City standards. Therefore this criteria is met.

REVISED DRAINAGE REHABILITATION PLAN FOR THE ELYSIAN IN-FILL SUBDIVISION PROJECCT CITY OF MCMINNVILLE, YAMHILL COUNTY, OREGON

Prepared for

OREGON DEPARTMENT OF STATE LANDS
775 Summer Street Northeast, Suite 100
Salem, Oregon 97301-1279
(Application 62609-RF)

and

U.S. ARMY CORPS OF ENGINEERS
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Post Office Box 2946
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(Action Number NWP 2020-374)

Prepared by

TERRA SCIENCE, INC.
4710 S.W. Kelly Avenue, Suite 100
Portland, Oregon 97239

TSI 2020-0721

December 2020

Revised Rehabilitation Plan for Elysian In-Fill Subdivision Ditch Relocation Project
Identified Portion of Tax Lot 202 and Tax lot 204, T. 04S, R. 04W, Sec. 18AD, City of McMinnville, Yamhill County
DSL Permit Application 62609-RF and USACE NWP 2020-374

1.0 Introduction and Background

On behalf of VJ-2 Development (Applicant), Terra Science, Inc. (TSI) has prepared the following rehabilitation plan for the Elysian In-Fill Subdivision project located in the City of McMinnville, Yamhill County, Oregon. Drainage rehabilitation efforts discussed herein would occur within Tax lot 204 on Yamhill County Assessor's map Township 04 South, Range 04 West, Section 18AC, Willamette Meridian. The centroid of the proposed rehabilitation action footprint is approximated at 45.223416° north and -1223.222937° west.

The project is currently being reviewed for Oregon Department of State Lands (DSL) Application 62609-RF and U.S. Army Corps of Engineers (USACE) Application NWP 2020-374. Materials herein supersede rehabilitation plans outlined in TSI's August 2020 plan.

2.0 Existing Site Conditions

The project site is situated on relatively flat terraces completely surrounded by residential development. Conditions of the project area are documented within the Pacific Habitat Services, Inc. (PHS) August 2018 *Wetland Delineation for the Meadows Drive property (Tax Lot 204) in McMinnville, Oregon* (DSL Determination WD WD#2019-0081) and March 2015 *Wetland Delineation for the NW Neighborhood Park Site* (DSL determination WD#2015-0122). As reviewed and concurred with by DSL, PHS defined Wetland A and a non-jurisdictional Excavated Ditch 1.

For the purposes of this report and Joint Permit Application (JPA) exercises, the PHS Wetland A feature has been dissected into three distinct features. Sub-delineation is based on the variable characteristics of Wetland A, including differences in vegetation, disturbances, Cowardin, and Oregon Hydrogeomorphic (OHGM) classifications. Specifically, the eastern edge of Wetland A (and upgradient upland) has been excavated to create a stormwater conveyance ditch while the southern edge of Wetland A has been excavated to form a subtle ditch (defined as the headwaters of the North Fork Cozine Creek). The remainder of Wetland A consists of a relatively flat alluvial terrace primarily supporting weedy, facultative (FAC) grass species. The following details sub-features of the PHS Wetland A polygon:

Excavated Stormwater Ditch: Originating in the northwest corner of the project area, this excavated feature originates from stormwater infrastructure beneath the existing NW Meadows Drive road stub. Constructed circa 2000, the feature conveys stormwater from the adjacent residential subdivisions south and into Wetland A. The feature flows through approximately twenty feet (20') of (remnant agricultural) culvert in the central portion. The north portion of the ditch (constructed in historic uplands) is typically three to four feet lower than surrounding terraces while the southern portion is one foot deeper than the surrounding landform. The north portion is contained in a thicket of *Populus balsamifera*, *Salix lasiandr*a, and *Rubus armeniacus* established along the top-of-bank; the bottom of the feature primarily supports *Typha latifolia* and *Veronica spp*. Ultimately, this feature meets the excavated headwaters of North Fork Cozine Creek in the southeast corner of the project

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site. This ditch best qualifies as Palustrine, Emergent, Saturated / Semipermanently / Seasonally Flooded, excavated (PEMYx) and Riverine Flow Through (RFT) OHGM classification.

The entirety of the Excavated Stormwater Ditch is proposed to be permanently impacted for this project. At the request of DSL Coordinator DeBlasi, a Stream Function Assessment Method for Oregon (SFAM) analysis was conducted for this feature in November 2020 (provided as report Appendix B).

North Fork of Cozine Creek: Originating at stormwater infrastructure immediately east of the (offsite) Westside Greenway Path, this feature consists of a shallow excavated ditch created circa 2010. The feature extends along the south portion of the project area until it joins the Excavated Stormwater Ditch then flows offsite. The ditch is typically one foot lower than the surrounding terraces and is primarily dominated by *Typha latifolia* and *Veronica spp*. Similar to the Stormwater Ditch, this feature is supported by stormwater runoff from adjacent subdivision developments. The feature best qualifies as Cowardin class PEMYx with a RFT OHGM classification. At the request of DSL Coordinator DeBlasi, a SFAM analysis was conducted for this feature in November 2020 (provided as report Appendix B).

Wetland A: Centrally located within the project area, this feature consists of a remnant agricultural terrace which now supports a non-native facultative community dominated by *Holcus lanatus*, *Epilobium ciliatum*, *Schedonorus arundinacea*, and *Cirsium arvense*. Relatively flat, this feature is primarily supported by precipitation and upslope seasonal groudwater seepage (PHS, 2018). The feature best qualifies as PEMY with a Slope / Flats OHGM classification. As wetland, an Oregon Rapid Wetland Assessment Protocol (ORWAP) functional analysis was conducted for this feature (included as JPA Appendix H).

3.0 Proposed Development

Applicant's project consists of a two phased, eighteen (18)-lot single-family residential subdivision. This in-fill development is divided into two phases: Phase I involves connecting NW Meadows Drive currently terminated within subdivisions to the north and south; six residential lots would be constructed adjacent the Meadows Drive extension. Phase II involves construction of the remaining twelve lots surrounding the proposed Fendle Way cul-de-sac construction. Stormwater generated by new impervious cover would be conveyed to Low Impact Development (LID) stormwater treatment facilities situated within the southeast corner of the development. Water, electric, gas, communication and sanitary sewer utility line infrastructure would be extended into each phase from adjacent subdivision developments.

Approximately 180 linear feet (LF) of North Fork Cozine Creek east of the proposed NW Meadows Drive connection would be enhanced and rehabilitated within dedicated community open spaces along the southern project boundary. Identified stormwater infrastructure facilities and the drainage rehabilitation portions of the project would be constructed during Phase I of subdivision construction (anticipated to occur in summer 2021).

4.0 Drainage Rehabilitation Goals and Objectives

Drainage rehabilitation goals include:

1. Excavation of a more naturalistic and slightly sinuous channel during Phase I site construction (in summer 2021);

2. Installation of native trees, shrubs and herbaceous species to facilitate adjacent wetland and riparian community development (in fall 2021);

3. Placement of the rehabilitated ditch feature (LID stormwater facility, and adjacent riparian areas) within a separate and dedicated open space tract to be owned and managed by the (pending) Home Owners Association (HOA), and;

4. Management of the dedicated open space in accordance with Westech Engineering, Inc.s' (WEI) June 2020 *Stormwater Management Report Prepared for VJ2 Development* (provided as JPA Appendix C).

5. Provide immediate and local replacement of impacted function and values potentially lost via development of the existing Excavated Stormwater Ditch and North Fork Cozine Creek ditches.

To aid in design considerations for the North Fork Cozine Creek rehabilitation project, existing and future site conditions are analyzed by applying Oregon's Stream Function Assessment Method for Oregon (SFAM). First, SFAM calculators assessed existing channel attributes of the Excavated Stormwater Ditch and ditched North Fork Cozine Creek; next, the future condition of the enhanced channel and riparian corridor is calculated based on anticipated topography, hydrology, plant communities and habitat characteristics.

As outlined in Table 1, the proposed rehabilitation is anticipated to result in immediate local gains of stream function and value. Specifically, function and value ratings increases are anticipated for Hydrology Function and Geomorphic Function. While calculating similar ratings, the proposed condition would also provide higher scores for Biologic Function.

SFAM reporting for the existing excavated features is provided in JPA Appendix H. SFAM reporting for the anticipated North Fork Cozine Creek enhancement zone are provided as Appendix B of this report.

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Table 1. SFAM summary for representative excavated drainage impacts and proposed rehabilitation channel.

Grouped Functions		Existing Conditions				Proposed Conditions	
		Excavated Stormwater Ditch		North Fork Cozine Creek Ditch		Enhanced North Fork Cozine Creek	
		Representative Function	Rating	Representative Function	Rating	Representative Function	Rating
Hydrologic Function	Function Rating	FV	Moderate	FV	Moderate	SWS	Moderate
	Value Rating		Moderate		Moderate		Higher
Geomorphic Function	Function Rating	SC	Moderate	SM	Moderate	SC	Higher
	Value Rating		Moderate		Higher		Moderate
Biologic Function	Function Rating	STS	Lower	STS	Moderate	STS	Moderate
	Value Rating		Moderate		Moderate		Moderate
Water Quality Function	Function Rating	CR	Lower	CR	Moderate	TR	Moderate
	Value Rating		Moderate		Moderate		Moderate

Function Modifiers:
FV: Flow Variation SWS: Surface Water Storage SC: Sediment Continuity
STS: Sustain Trophic Structure CR: Chemical Regulation TR: Thermal Regulation

The rehabilitated channel and associated wetland / upland riparian corridor would provide immediate function and value benefits to the North Cozine Creek headwaters. When coupled with purchase of compensatory mitigation credits at the Mud Slough Wetland Mitigation Bank, the rehabilitation project is anticipated to offset and increase aquatic function and values lost by the proposed development.

5.0 Construction Methods and Specifications

Prior to construction, Applicant's team of selected contractors and project engineers would meet to review construction plans and (pending) agency authorizations. Erosion and sediment control measures outlined within WEI's Erosion and Sediment Control Plan (provided as JPA Appendix D) would then be installed prior to commencing earthwork. Target elevations and drainage configurations would then be surveyed and field marked. All drainage rehabilitation activities would occur during the Phase I construction period between June 01 and October 15, 2021.

Construction would begin at the upgradient end of the drainage during NW Meadows Drive construction; actions would expand easterly towards the point where the feature leaves the subject parcel. Grading is anticipated to utilize excavators, haul trucks and similar equipment (as deemed necessary) to achieve target grades. The final channel would be slightly wider than the existing ditch and would have a low- and high flow profile bench (which would continue to qualify as wetland). Abandoned sections of the existing ditch (at the confluence of the Excavated Stormwater Ditch) would be permanently filled for construction of the LID stormwater facility; these abandoned areas have been calculated within the impact analysis (detailed within the JPA).

Areas adjacent the rehabilitated drainage would be managed as wetland / upland riparian corridor. Existing *Rubus armeniacus* brambles would be mechanically removed during rehabilitation actions. Existing trash, debris, and piles of fill material would be removed to create a relatively flat terrace adjacent the drainage.

Upon completion of construction actions, native seed mixtures and tackifiers would be hydroseed broadcast throughout the rehabilitation zone and LID stormwater facility. Next, contractors would identify target planting zones for installation of new woody materials throughout the relocated drainage, stormwater basin, and riparian areas. All materials would be installed in accordance with Clean Water Services standards[1]. Materials would be grouped together in small clumps of five to seven individuals to create a naturalistic appearance. The following table outlines anticipated species and quantities to be installed throughout the dedicated riparian corridor.

Table 2. Material installation specifications.

Common Name / Scientific Name	Condition	Quantity
Relocated / Enhanced Drainage		
Tall mannagrass (*Glyceria elata*)	Seed	1.0 lbs.
Western mannagrass (*Glyceria occidentalis*)	Seed	2.5 lbs.
Slough sedge (*Carex obnupta*)	Emergent Plug	100
Spreading rush (*Juncus patens*)	Emergent Plug	100
Douglas spirea (*Spirea douglasii*)	Bareroot	50
Riparian Corridor		
Riverbank lupine (*Lupinus rivularis*)	Seed	7.0 lbs.
Tufted hairgrass (*Deschampsia cespitosa*)	Seed	1.0 lbs.
Western mannagrass (*Glyceria occidentalis*)	Seed	4.0 lbs.
Yarrow (*Achillea millefolium*)	Seed	0.5 lbs.
Soft rush (*Juncus effusus*)	Emergent Plug	250 lbs.
Oregon ash (*Fraxinus latifolia*)	Bareroot	25
Red alder (*Alnus rubra*)	Bareroot	25
Douglas spirea (*Spirea douglasii*)	Bareroot	100
Wild rose (*Rosa pisocarpa*)	Bareroot	75
Oregon oak (*Quercus garryana*)	Bareroot	25

[1] Clean Water Services standards are proposed as the City of McMinnville has not adopted LID standards for residential development at the time of report production.

6.0 Long Term Protection

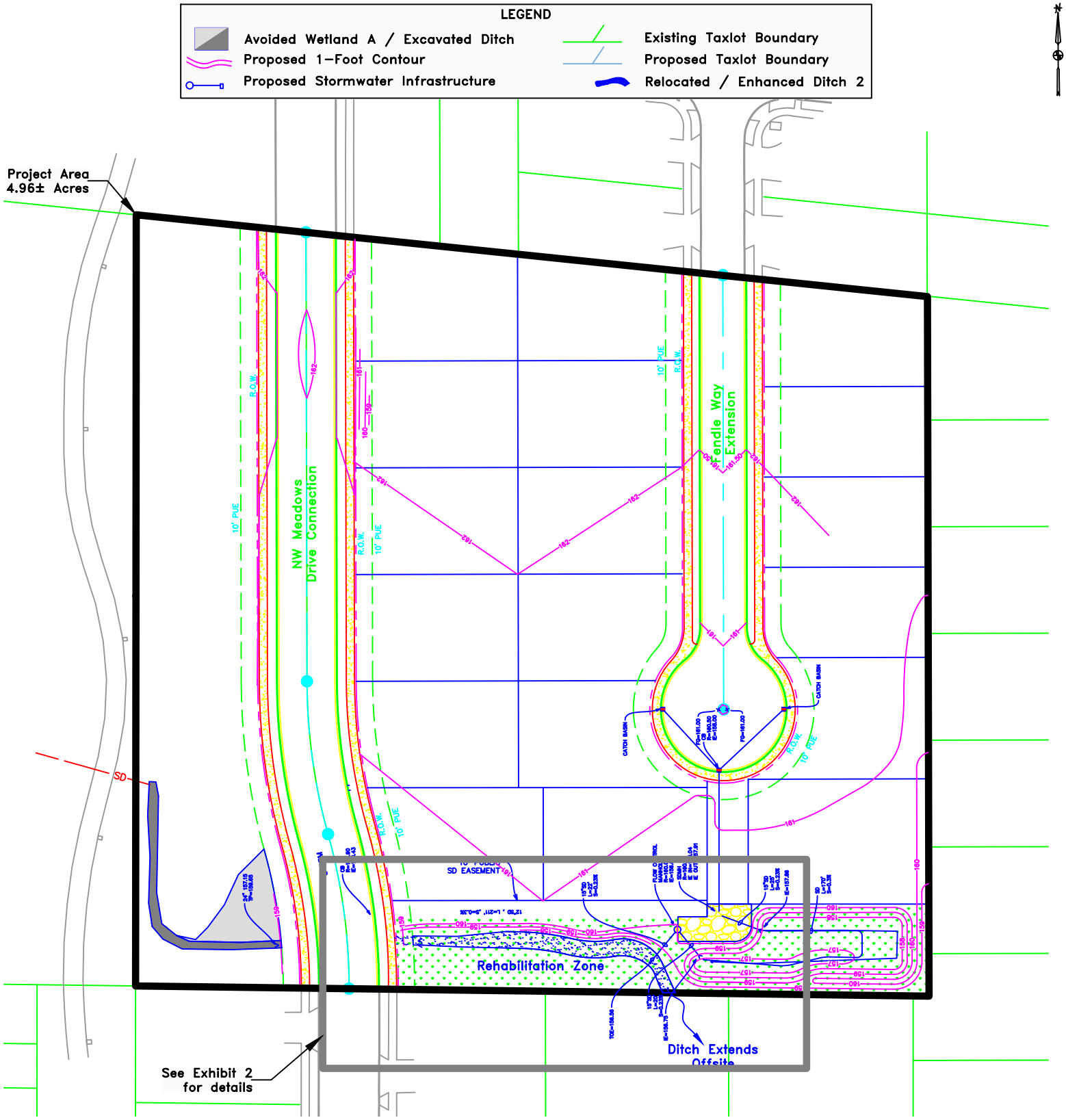
As outlined on the pending development plan, the rehabilitated drainage and associated riparian corridor would be placed within a distinct and independent tract. Said tract would be placed under long-term ownership and management of the (pending) HOA. Ultimately the rehabilitation area would be managed and maintained in association with the LID stormwater basin.

Within ninety days of completion of construction Applicant or their designates would prepare a detailed report to document the as-built condition of the rehabilitation project; said report would be compiled to meet reporting requirements of Department of Environmental Quality (DEQ) post-construction reporting. The as-built report would include an as-built topographic survey and construction diagrams necessary to document the final contours of the rehabilitated drainage and dedicated riparian corridor. The report would also discuss realized variations, document quantities and installation techniques of the revegetation effort. Photographs would also be provided to document the construction, installation and as-built condition of the drainage.

The relocated drainage would be managed and maintained in accordance with operations and maintenance manuals for this subdivision project.

APPENDIX A

Drainage Rehabilitation Plan Figures



NOTE: Approximately 180 linear feet (LF) of excavated North Fork Cozine Creek east of the proposed NW Meadows Drive connection would be rehabilitated and placed within dedicated community open spaces along the southern project boundary. Identified stormwater infrastructure facilities and the rehabilitation zone would be constructed during Phase I of subdivision construction (anticipated for summer 2021).

Source: Adapted from Westech Engineering, Inc. civil files.

Terra Science, Inc.
Soil, Water, & Wetland Consultants

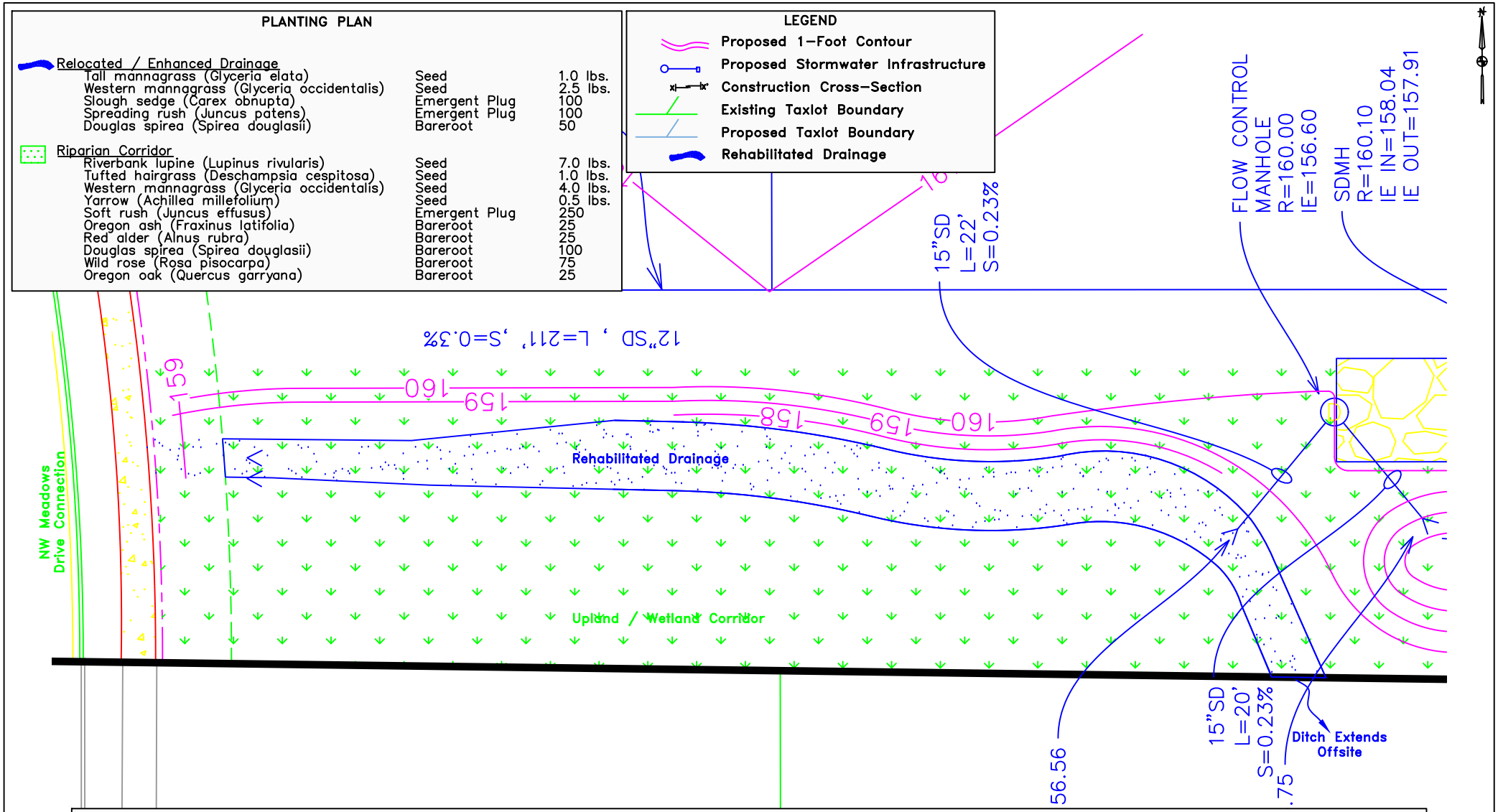
GRAPHIC SCALE
0 40 80
(IN FEET)

REVISED DRAINAGE REHABILITATION PLAN
FOR THE ELYSIAN IN-FILL SUBDIVISION PROJECT
(DSL App. 62609-RF & USACE NWP 2020-374)
City of McMinnville, Yamhill County, Oregon

CONCEPTUAL DEVELOPMENT

December 2020

EXHIBIT 1



NOTE: Construction would begin at the upgradient end of the existing ditch during NW Meadows Drive construction; rehabilitation efforts would then work easterly towards the point where the drainage leaves the subject parcel. Grading is anticipated to utilize excavators, haul trucks and similar equipment (as deemed necessary) to achieve target grades. Upon completion of construction actions, native seed mixtures and tackifiers would be hydroseed broadcast throughout the rehabilitataed drainage and associated riparian corridor. Next, contractors would identify target planting zones for installation of new woody materials throughout the relocated ditch, stormwater basin, and immediately adjacent upland areas. All materials would be installed in accordance with Clean Water Services standards. Materials would be grouped together in small clumps of five to seven individuals to create a naturalistic appearance.

See report text for greater discussion of project goals and construction specifications.

Source: Adapted from Westech Engineering, Inc. civil files.

Terra Science, Inc.
Soil, Water, & Wetland Consultants

GRAPHIC SCALE
0 10 20
(IN FEET)

REVISED DRAINAGE REHABILITATION PLAN
FOR THE ELYSIAN IN-FILL SUBDIVISION PROJECT
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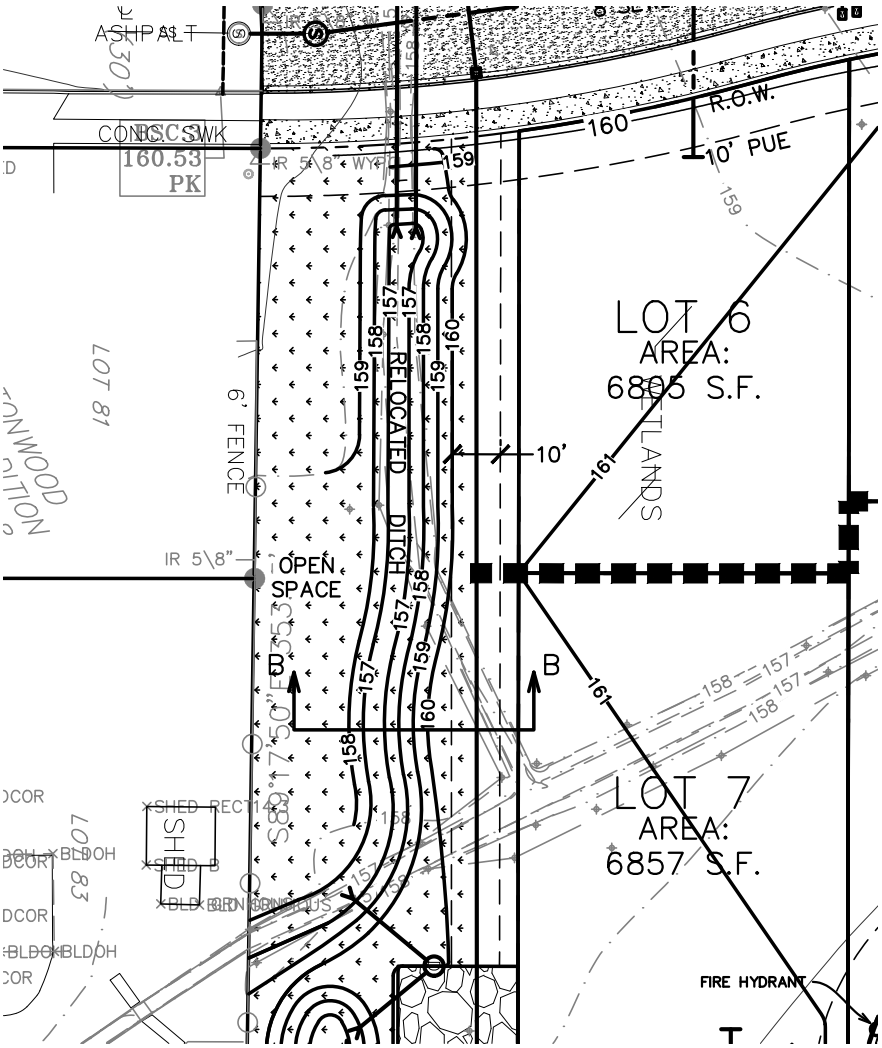
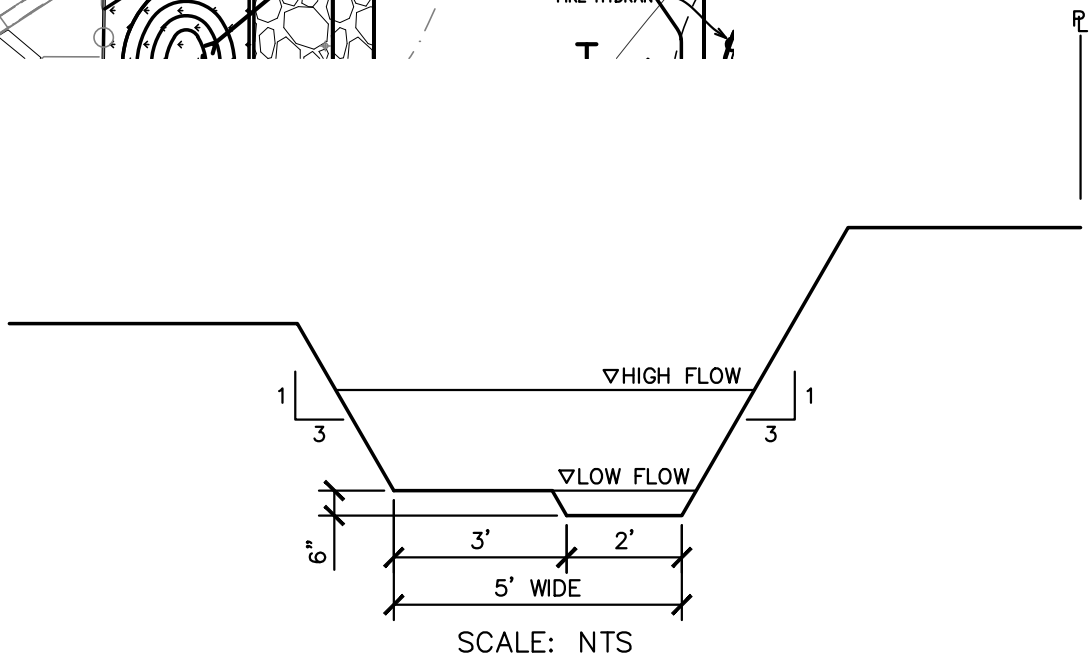
City of McMinnville, Yamhill County, Oregon

December 2020

CONCEPTUAL DEVELOPMENT

EXHIBIT 2





SCALE: NTS

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
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Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

DSN.	JW
DRN.	IH
CKD.	JW
DATE:	JUNE 2020

DON JONES ELYSIAN SUBDIVISION

CROSS SECTION DETAIL B – B

FIGURE

JOB NUMBER 2931.1000

2/24/2021 12:59:12 PM
E:\DWGS\Don Jones - Subdivision - 2931.1000\Don Jones - Subdivision - 2931.1000\Civil\Plots_CROSS SECTION DETAIL.dwg, (WL

APPENDIX A

SFAM Report for Anticipated North Cozine Creek Rehabilitation Zones

STREAM FUNCTION ASSESSMENT METHOD for OREGON

Version 1.1 (April 2020)

Name of Project Area:	North Fork Cozine Creek (Proposed)	**Date of Field Assessment:**	N/A	**Latitude*:**	45.2234
Data Collector:	D. Monnin, PWS	**Elevation:** (SFAM Report)	158	**Longitude*:**	-123.2230
				** near center of the project site*	
Project Number:	TSI Project 2020-0721, DSL Application 62909-RF, USACE NWP 2020-374	**Project Area Length (feet):**	198	**Project Area (acres):**	0.04-acre
Assessment timing:	Predicted conditions	**Photo Numbers:**			

What is the Oregon Stream Classification for the project area? Select from drop-down menu. Refer to the SFAM Report. If the project area spans more than one reach, describe the dominant stream classification.	Mountain Wet Rain High Permeability

What ratings does the Oregon Stream Classification identify for the following measures in the local hydrologic unit? Refer to the SFAM Report. If project area spans more than one reach, describe the dominant classification:

Aquifer Permeability (local)	High	Soil Permeability (local)	High	
Erodibility (local)	Easily Erodible	Gradient*	> 6%	*If EPA Classification is different from the gradient you observe in the local reach, select the gradient in the local reach.

Is the channel perennial, intermittent, or ephemeral? (Map Viewer-NHD Flowline)	Perennial	
Which Level III EPA Ecoregion is the site located in? (SFAM Report)	Willamette Valley	Western Mountains
Is the average width of the stream less than or greater than 50 feet? (User Input)	≤ 50 feet	Small
What is the 2 year peak flood (cfs)? (StreamStats Report)	1.14	
What is the size of the drainage area (mi^2)? (StreamStats Report)	0.1	

External Data: List below the persons and/or agencies that provided location information on rare wildlife species, and/or rare plants, and the date the information was gathered (if known).

Oregon Explorer SFAM and ORWAP reports identify the Project Area as having Intermiediate (0.33) Maximum Score for potential habitat support for Amphibian & Reptile Species and Plant Species.

Project Area History: Based on conversation with landowner/manager and other information, describe below the years and extent (% of project area) of past and present management actions (e.g., vegetation control), natural disturbances (e.g., fire, insect infestations), and human-associated disturbances (e.g., grazing regimes).

SFAM utilized to assess anticipated conditions for the rehabilitated and enhanced headwaters of the North Fork of Cozine Creek to be constructed in conjunction with the Elysian subdivision and NW Meadows Drive extension project. Assessed condition includes (slightly) meandering channel with high and low flow benches. Enhanced drainage would be seeded, planted, and maintaioned in accordance with Clean Water Services standards for stormwater infrastructure. Anticipated condition includes riparian corridor with native herbaceous, shrub, and tree species contained within dedicated parcel to be managed as open space managed by (pending) Homeowners Association.

Assessment Notes: Note any special features of the reach or landscape, problems with scoring, or other information that may be relevant.

Due to thin width of ehnanced drainage, default 50' Proximal Assessment Area (PAA) and Extended Assessment Area (EAA) widths are utilized. PAA and EAA south of feature consist of privately owned residental lands (houses, lawns, etc) behind cedar fencing. As no access is granted, PAA and EAA assessments south of ditch feature are abbreviated to accessible Applicant owned properties. .

STREAM ASSESSMENT SCORES SHEET **Version 1.1** **Assessment Timing:** **Predicted conditions**

Project Area Name:	North Fork Cozine Creek (Proposed)		
Investigator Name:	D. Monnin, PWS		
Date of Field Assessment:	N/A		
Latitude (decimal degrees):	45.2234	Longitude (decimal degrees):	-123.2230

SPECIFIC FUNCTIONS	Function Score	Function Rating	Value Score	Value Rating
Surface Water Storage (SWS)	3.06	Moderate	8.33	Higher
Sub/Surface Water Transfer (SST)	2.86	Lower	10.00	Higher
Flow Variation (FV)	3.81	Moderate	6.25	Moderate
Sediment Continuity (SC)	7.95	Higher	5.17	Moderate
Sediment Mobility (SM)	3.58	Moderate	7.50	Higher
Maintain Biodiversity (MB)	3.01	Moderate	3.00	Moderate
Create and Maintain Habitat (CMH)	1.03	Lower	5.00	Moderate
Sustain Trophic Structure (STS)	6.61	Moderate	4.50	Moderate
Nutrient Cycling (NC)	3.79	Moderate	5.70	Moderate
Chemical Regulation (CR)	3.10	Moderate	5.70	Moderate
Thermal Regulation (TR)	6.55	Moderate	7.00	Moderate

GROUPED FUNCTIONS	REPRESENTATIVE FUNCTION	Function Group Rating	Value Group Rating
Hydrologic Function (SWS, SST, FV)	Surface Water Storage (SWS)	Moderate	Higher
Geomorphic Function (SC, SM)	Sediment Continuity (SC)	Higher	Moderate
Biologic Function (MB, CMH, STS)	Sustain Trophic Structure (STS)	Moderate	Moderate
Water Quality Function (NC, CR, TR)	Thermal Regulation (TR)	Moderate	Moderate

Formulas for each specific function and value (shown on Subscores tab) produce a numerical score between 0.0 and 10.0. For ecological functions, a score of 0.0 indicates that negligible function is being provided by the stream whereas a score of 10.0 indicates that the stream is providing maximum function (as defined) given certain contextual factors. For values, a score of 0.0 indicates that there is low opportunity for the site to provide a specific ecological function and that, even if it did, the specific function would not be of particular significance given the context of the site. Conversely, a value score of 10.0 indicates that a site has the opportunity to provide a specific function and that it would be highly significant in that particular location. For all function and value formulas, both extents of the scoring range (0.0 and 10.0) are mathematically possible.

To facilitate conceptual understanding, numerical scores are translated into ratings of Lower, Moderate, or Higher. The numerical thresholds for each of these rating categories are consistent across all functions and values such that scores of <3.0 are rated “Lower,” scores ≥3.0 but ≤7.0 are rated “Moderate,” and scores that are >7.0 are rated “Higher.” These thresholds are consistent with the standard scoring scheme applied to all individual measures.

Each specific function, and its associated value, is included in one of four thematic groups: hydrologic, geomorphic, biologic, and water quality functions. Group ratings provide an indication of the degree to which each group of processes is present at a site. Groups are represented by the highest-rated function with the highest-rated associated value among the 2-3 functions that comprise each group. This hierarchical selection system ensures that thematic functional groups are represented by the highest-performing and highest-valued ecological function.

SFAM Site Layout Field Data Form **Version 1.1** **Assessment Timing:** Predicted conditions

Project Area Name: North Fork Cozine Creek (Proposed) Date: N/A Assessor: D. Monnin, PWS

Print this form to take to the field, along with the PAA and EAA field forms. Use the instructions, measurements, and diagrams on this form to establish the two assessment areas necessary for data collection.

Project Area Description:

Anticipated North Fork Cozine Creek consists of (slightly) meandering channel containing high and low flow benches. Channel and adjacent riparian zones to be planted and maintained with native vegetation.

Is there a Floodplain?

No; North Fork of Cozine Creek is not associated with a floodplain.

Establishing the boundaries of the Proximal Assessment Area (PAA):

a) Identify the spatial extent of direct impact.

b) Establish the longitudinal boundaries of the PAA at the upstream and downstream extent of the impact, or 50ft of stream length, whichever is greater.

c) Locate the center of the PAA and measure the bankfull channel width (BFW).

d) At two additional locations, equidistant between the PAA center and the PAA upper and lower boundaries, measure BFW. PAA transects will be located at the 3 locations where BFW was measured.

e) Establish the lateral boundaries of the PAA at a distance of 2 × the average BFW or 50' from the stream edge (bankfull edge), whichever is greater, on each side of the stream.

Total PAA stream length (ft) =	198
Distance between transects (PAA length ÷ 4) =	49.5
PAA lateral boundary (2 × avg bankfull width (calculated below) or 50 feet =	50

Bankfull Width:			
Transect	Location	Width (ft)	Average
T1	49.5	3.5	4
T2	109.5	4.9	
T3	149	4.3	

	Latitude	Longitude
Corner 1	45.22234	-123.2226
Corner 2	45.22361	-123.22273
Corner 3	45.22335	-123.22337
Corner 4	45.22355	-123.22337

Establishing the boundaries of the Extended Assessment Area (EAA):

a) The EAA is an upstream and downstream extension of the PAA. Establish the longitudinal boundaries by multiplying the average BFW by 5 and measuring that distance upstream and downstream from the PAA upper and lower boundaries, respectively.

b) The lateral boundaries of the EAA are the same distance from the stream edge (bankfull) as the lateral boundaries for the PAA (above). Note that the EAA contains the entire PAA.

c) Locate the 11 EAA transect locations by dividing the total EAA length by 10. The distance between each transect is 0.1 × the total EAA length. Transects include the upper and lower EAA boundaries.

Length EAA extends above/below PAA (5 × average BFW) =	21.16666667
Total EAA length (10 × BFW + PAA length, rounded to nearest 10') =	240.3333333
Distance between EAA transects (EAA length ÷ 10) =	24.03333333

	Latitude	Longitude
Corner 1	45.22334	-123.22252
Corner 2	45.22363	-123.22263
Corner 3	45.22335	-123.22344
Corner 4	45.22327	-123.22345

SFAM Proximal Area Assessment (PAA) Field Data Form **Version 1.1** **Assessment Timing:** Predicted conditions

Project Area Name: North Fork Cozine Creek (Proposed) Date: N/A Assessor: D. Monnin, PWS

Print this form to take to the field. Only the defined print area is needed (i.e. not the data calculation columns). After collecting data in the field, transfer data into the Excel worksheet below using drop-down menus where available. Cells in the "Calculations" section and on the "Functions" tab will populate automatically.

What is the longitudinal length of the PAA?	**Natural Cover (F1)**: Record densiometer readings from both left and right banks at each transect.				**See F2-F4 below**	**Riparian Corridor (F5):** Record the width (ft) of the riparian corridor at each PAA transect. If > 330 ft, enter 330.				**Barriers (F6):** Does a man-made structure limit fish passage (barrier, partial, passable, unknown, none)?	**Exclusion (F7):** What % of the 100-yr floodplain is excluded due to features (<=20%, >20-40%, >40-80%, >80%)?
		T1	T2	T3			T1	T2	T3		
	Left	15	15	15		Left	20	25	20	Blocked	<=20%
198	Right	15	15	15		Right	25	20	25		

Invasive Vegetation (F2), Native Woody Vegetation (F3), and Large Trees (F4) *:* For each of the three vegetation classes, record the start and end positions (distance from bankfull, to the nearest 0.1ft) of each occurrence along the length of the transect. Transects run perpendicular to the stream edge, from the bankfull edge to the lateral boundary of the PAA.

What is the length of the transect (ft)?	73	Vegetation transects are conducted on both banks. If it is physically or legally unfeasible to access one side, indicate which side was surveyed by selecting Left or Right from the dropdown menu.	

Transect	Vegetation Class	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
1 (left)	InvVeg	0	0														
	Native WoodyVeg	0	20														
	LgTree	0	0														
1 (right)	InvVeg	0	0														
	Native WoodyVeg	0	25														
	LgTree	0	0														
2 (left)	InvVeg	0	0														
	Native WoodyVeg	0	25														
	LgTree	0	0														
2 (right)	InvVeg	0	0														
	Native WoodyVeg	0	20														
	LgTree	0	0														
3 (left)	InvVeg	0	0														
	Native WoodyVeg	0	20														
	LgTree	0	0														
3 (right)	InvVeg	0	0														
	Native WoodyVeg	0	25														
	LgTree	0	0														

Armor (F8) and Erosion (F9): Record start and end locations (ft) of bank armoring features and bank erosion evidence along the length of the PAA.

	Start	End	Start	End	Start	End	Start	End
Armoring (left)	0	0						
Armoring (right)	0	0						
Erosion (left)	0	0						
Erosion (right)	0	0						

Overbank Flow (F10): Is there evidence of overbank flow at least 0.5 × BFW from the bankfull edge? *(yes or no)*	NO

Wetland Vegetation (F11): Are there FACW or OBL wetland plants on the banks or in the floodplain? *(yes or no)*	YES
If yes, answer the following questions: If no, enter N/A	
→ Are any located > 0.5 × BFW from the bankfull edge?	YES
→ …for more than 70% of the PAA length?	YES

SFAM Extended Area Assessment (EAA) Field Data Form **Version 1.1** **Assessment Timing:** Predicted conditions

Project Area Name: North Fork Cozine Creek (Proposed) Date: N/A Assessor: D. Monnin, PWS

Print this form to take to the field. Only the defined print area is needed (i.e. not the data calculation columns). After collecting data in the field, transfer data into the Excel worksheet below using drop-down menus where available. Cells in the "Calculations" section and on the "Functions" tab will populate automatically.

What is the total longitudinal length of the EAA (ft)?	236

Wood (F14): Tally each piece of wood along the EAA that measures > 4" diameter and is at least 5' long. You can record the location of the wood to avoid double counting.

Total = 50

Side Channels (F12) and Lateral Migration (F13): Record start and end locations (ft) of adjacent side channels and evidence of constraints to lateral migration along the length of the EAA.

	Start	End	Start	End	Start	End	Start	End	Start	End
Side channels (either side)	0	0								
Constraints to lateral migration (left)	0	0								
Constraints to lateral migration (right)	0	0								

Unique Features (V16): Note the presence of any unique habitat features throughout the EAA including, but not limited to: log jams, braided channels, >30% wetlands in floodplain, springs, seeps, cold water inputs, etc.

None.

		Wetted Width (F17)	**Incision (F15)**		**Substrate Embeddedness (F16)**					**Thalweg Depth (F17)**									
		Record width and height at each cross-channel transect (round to nearest 0.1 ft).			Record % embeddedness (to the nearest quartile: 0, 25, 50, 75, 100) at 5 equidistant points along each cross-channel transect.					Record the thalweg depth at 10 equidistant points between each cross-channel transect while moving upstream.									
EAA Transect	Feet from EAA lower boundary	Wetted width	Bankfull height	Lowest floodplain height	Embed1	Embed2	Embed3	Embed4	Embed5	Depth1	Depth2	Depth3	Depth4	Depth5	Depth6	Depth7	Depth8	Depth9	Depth10
A	0	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
B	23.6	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
C	47.2	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
D	70.8	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
E	94.4	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
F	118	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
G	141.6	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
H	165.2	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
I	188.8	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
J	212.4	5	0.25	0.5	100	100	100	100	100	0.25	0.25	0.25	0.4	0.5	0.5	0.4	0.25	0.25	0.25
K	236	5	0.25	0.5	100	100	100	100	100										

Elysian North Fork Cozine Creek (Excavated Ditch) Project Area

Legend

States & Provinces
- Other States and Provinces
- Oregon

Notes

Add your notes here

0.0 0 0.01 0.0 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output for reference only from: ORWAP and SFAM Map Viewer
Data layers that appear on this map may or may not be accurate, current, or reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION.

OREGON EXPLORER

Stream Function Assessment Method (SFAM) Report

Report Generated: November 20, 2020 12:45 PM

Location Information

Latitude	45.2234 N	Longitude	-123.223 W
Elevation	158 ft	Level III Ecoregion	Willamette Valley
HUC8	17090008 Yamhill		
HUC10	1709000807 Yamhill River		
HUC12	170900080701 South Yamhill River		
Linear ft of stream in HUC8	39,370	Annual precipitation	46 in

Stream Type and Classifications

Stream Classification	Mountain Wet Rain / Valley Wet	Percent of project area	100.00%
Aquifer permeability	High	Soil permeability	High
Gradient	>6%	Erodibility	Easily_Erodible

Stream classifications and associated attributes are derived from a U.S. Environmental Protection Agency stream classification geospatial data layer developed for Oregon (2015). This layer provides a statewide stream/watershed classification system for streams and rivers of various sizes, based in part on a hydrologic landscape classification system.

Report Generated: November 20, 2020 12:45 PM

Rare Species Scores and Special Habitat Designations

Rare Species Type	Maximum score	Sum Score	Rating
Non-anadromous Fish Species	0	0	None
Amphibian & Reptile Species	0.33	0.33	Intermediate
Feeding Waterbirds	0	0	None
Songbirds, Raptors, and Mammals	0	0	None
Invertebrate Species	0	0	None
Plant Species	0.33	0.33	Intermediate

Scores have taken into account several factors for each rare species record contained in the official database of the Oregon Biodiversity Information Center (ORBIC): (a) the regional rarity of the species, (b) their proximity to the point of interest, and (c) the "certainty" that ORBIC assigns to each of those records.

Within 300 ft of a Special Protected Area?	No
Within a HUC12 that has designated Essential Salmonid Habitat?	Yes
Within 2 miles of an Important Bird Area?	No

Water Quality Impairments

Query returned no records.

Water quality information is derived from Oregon's 2012 Integrated Report, including the list of water quality limited waters needing Total Maximum Daily Loads (303d List). Each record in the report is assigned an assessment category based on an evaluation of water quality information. Categories included in the SFAM Report are:

Category 5: *Water is water quality limited and a TMDL is needed; Section 303(d) list.*

Category 4: *Water is impaired or threatened but a TMDL is not needed because: (A) the TMDL is approved, (B) other pollution requirements are in place, or (C) the impairment (such as flow or lack of flow)*

is not caused by a pollutant.

Category 3B: *Water quality is of potential concern; some data indicate non-attainment of a criterion, but data are insufficient to assign another category.*

Dominant soil type(s)			
Soil Type	Erosion Hazard Rating	Hydric Rating	Percent Area
Amity silt loam, 0 to 3 percent slopes	Slight	N/A	100.00%

This report contains both centroid-based and polygon-based data. The Location Information section of the report contains centroid-based data (determined by the center point of the polygon), while the remaining sections are polygon-based (determined from the entire polygon).

StreamStats Report for Elysian NF Cozine Creek

Region ID: OR
Workspace ID: OR20201120204719650000
Clicked Point (Latitude, Longitude): 45.22339, -123.22304
Time: 2020-11-20 12:47:38 -0800

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0827	square miles
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	1.98	inches
SOILPERM	Average Soil Permeability	0.8	inches per hour
JANMAXT2K	Mean Maximum January Temperature from 2K resolution PRISM 1961-1990 data	46	degrees F

Parameter Code	Parameter Description	Value	Unit
WATCAPORC	Available water capacity from STATSGO data using methods from SIR 2005-5116	0.19	inches
ORREG2	Oregon Region Number	10001	dimensionless
BSLOPD	Mean basin slope measured in degrees	0.41	degrees
JANMINT2K	Mean Minimum January Temperature from 2K resolution PRISM PRISM 1961-1990 data	33.1	degrees F
ELEV	Mean Basin Elevation	169	feet

Peak-Flow Statistics Parameters[Reg 2B Western Interior LT 3000 ft Cooper]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0827	square miles	0.37	7270
BSLOPD	Mean Basin Slope degrees	0.41	degrees	5.62	28.3
I24H2Y	24 Hour 2 Year Precipitation	1.98	inches	1.53	4.48
ELEV	Mean Basin Elevation	169	feet		
ORREG2	Oregon Region Number	10001	dimensionless		

Peak-Flow Statistics Disclaimers[Reg 2B Western Interior LT 3000 ft Cooper]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report[Reg 2B Western Interior LT 3000 ft Cooper]

Statistic	Value	Unit
2 Year Peak Flood	1.14	ft^3/s
5 Year Peak Flood	1.65	ft^3/s
10 Year Peak Flood	2.04	ft^3/s
25 Year Peak Flood	2.56	ft^3/s
50 Year Peak Flood	2.96	ft^3/s
100 Year Peak Flood	3.37	ft^3/s
500 Year Peak Flood	4.38	ft^3/s

Peak-Flow Statistics Citations

Cooper, R.M.,2005, Estimation of Peak Discharges for Rural, Unregulated Streams in Western Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5116, 76 p. (http://pubs.usgs.gov/sir/2005/5116/pdf/sir2005-5116.pdf)

Application Version: 4.4.0

STREAM FUNCTION ASSESSMENT METHOD for OREGON

Name of Project Area:	North Fork Cozine Creek (Proposed)	Assessment Timing:	Predicted conditions	Orange Boxes are linked to the PAA or EAA Field forms Scores Automatically Calculated in Green Boxes

FUNCTIONS MEASURES TABLE

Check the orange boxes to confirm all field entries have transferred appropriately. If necessary the orange box entries can be hand entered. However, hand entry into the orange boxes will remove the link to the Field Form. A #DIV/0! or 'FALSE' entry means that the Cover Page, PAA Field Form or EAA Field Form is not complete.

Measure	Function Groups		Measure Abbreviation	Qualifiers		Data Entry (linked to field forms)	Error Messages		Measure Score
F1 **Natural Cover**	**What is the percent natural cover above the stream within the PAA?** Measure the percentage of cover above the stream, including both overstory and understory vegetation and overhanging banks, by averaging spherical densiometer measurements taken at each transect within the PAA. *Functions informed: Sustain Trophic Structure, Nutrient Cycling, Thermal Regulation*								
	Biology, Water Quality		Cover	WMTsmall	**Enter a percentage**: *(round to nearest whole number)*	88			0.65
F2 **Invasive Vegetation**	**What is the percent cover of invasive vegetation within the PAA ?** Consider the Oregon Department of Agriculture Noxious Weed list in Appendix 3 of the SFAM User Guide, and other sources of information, such as Oregon iMAPInvasives and iNaturalist. *Functions informed: Maintain Biodiversity, Sustain Trophic Structure*								
	Biology		InvVeg		**Enter a percentage**: *(round to nearest whole number)*	0			1.00
F3 **Native Woody Vegetation**	**What is the percent cover of native woody vegetation within the PAA** ? *Functions informed: Maintain Biodiversity, Create & Maintain Habitat*								
	Biology		WoodyVeg		**Enter a percentage**: *(round to nearest whole number)*	31			0.41
F4 **Large Trees**	**What is the percent cover of large trees (dbh>20in) within the PAA?** *Functions informed: Maintain Biodiversity, Create & Maintain Habitat*								
	Biology		LgTree	West	**Enter a percentage**: *(round to nearest whole number)*	0			0.00
F5 **Vegetated Riparian Corridor Width**	**What is the average width of the vegetated riparian corridor within the PAA?** An intact vegetated riparian corridor is defined as one typified by largely undisturbed ground cover and dominated by "natural" species. Natural does not necessarily mean pristine and can include both upland plants and species with wetland indicator status, and native and non-native species. Natural does not include pasture or cropland, recreational fields, recently harvested forest, pavement, bare soil, gravel pits, or dirt roads. Note that relatively small features, such as a narrow walking trail, that likely have negligible effects on water quality can be included within the vegetated riparian corridor width. *Functions informed: Nutrient Cycling, Chemical Regulation*								
	Water Quality		RipWidth		**Enter the average width (feet)**:	11	Caution! Entry not linked to Field Form		0.10
F6 **Fish Passage Barriers**	**Is there a man-made fish passage barrier in the PAA?** Select an answer from the drop-down menu. Man-made barriers to fish passage can include structures such as dams, culverts, weirs/sills, tide gates, bridges and fords that can block physical passage or can create unsuitable conditions for passage (e.g. high velocity). The level of passage provided can be researched in the office using the Man-made Fish Passage Barriers data layer (Fish Passage Barriers in the Habitat Group) in the SFAM Map Viewer, then confirmed in the field. Do not include natural barriers. If more than one barrier is present, answer for the one with the most restricted level of passage (e.g. Blocked). Not all barriers have been mapped. See the User Manual for more information. *Functions informed: Maintain Biodiversity, Create & Maintain Habitat*								
	Biology		Barriers		**Select Blocked, Partial, Passable, or Unknown in the PAA Field Form:**	Blocked			0.00
F7 **Floodplain Exclusion**	**What percent of the floodplain has been disconnected within the PAA?** For alluvial rivers, the floodplain is defined by a distinct break in slope at valley margins, a change in geologic character from alluvium to other, indications of historical channel alignments within a valley, or as the 100-year flood limit. Disconnection refers to any portion of the flood area no longer inundated due to levees, channel entrenchment, roads or railroad grades, or other structures (including buildings and any associated fill) within the proximal assessment area. All barriers should be included when estimating disconnection, even if the barrier is not present during all flood stages; EXCEPT where the structure is expressly managed for floodplain function and inundation. *Functions informed: Surface Water Storage, Create & Maintain Habitat*								
	Hydrology, Biology		Exclusion		**Enter <= 20%, >20 - 40%, >40 - 80%, or >80%.**	>80	Caution! Entry not linked to Field Form		FALSE
F8 **Bank Armoring**	**What percentage of the stream banks within the PAA are armored?** What percentage of the streambank has been stabilized using rigid methods to permanently prevent meandering processes? Examples of armoring include gabion baskets, sheet piles, rip rap, large woody debris that covers the entire bank height, and concrete. Bank stabilization methods that return bank erosion to natural rates and support meandering processes are not counted as armoring. Examples include many bioengineering practices, large woody debris placed along the bank toe, and in-stream structures that still use native vegetation cover on the streambanks. Percent armoring is calculated as the sum of the armored lengths of the left and right banks, divided by sum total lengths of both banks within PAA (i.e. twice the total PAA length). *Functions informed: Substrate Mobility*								
	Geomorphology		Armor		**Enter a percentage:** *(round to nearest whole number)*	0			1.00

F9 **Bank Erosion**	**What percentage of stream banks within the PAA are actively eroding or recently (within previous year or high flow) eroded?** Indications of active/recent erosion include vertical or near vertical bank stream banks that show exposed soil and rock, evidence of tension cracks, active sloughing, or that are largely void of vegetation or roots capable of holding soil together. The percent is calculated as the sum of lengths of left and right banks that are eroding, divided by the sum of total lengths of both banks within PAA. *Functions informed: Sediment Continuity*								
	Geomorphology		Erosion		**Enter a percentage:** *(round to nearest whole number)*	0			1.00
F10 **Overbank Flow**	**Does the stream interact with its floodplain within the PAA?** Is there evidence of fine sediment deposition (sand or silt) on the floodplain, organic litter wracked on the floodplain or in floodplain vegetation, or scour of floodplain surfaces, extending greater than 0.5xBFW onto either the right or left bank floodplain within the PAA? Do not include evidence from inset floodplains developing within entrenched channel systems. If the abutting land use limits the opportunity to observe evidence of overbank flow, is there other credible information that would indicate regular (at least every two years) overbank flow in the PAA? Examples of "other credible information" include first-hand knowledge, discharge/stream gauge measures, etc. Cite the evidence on the Cover Page. *Functions informed: Surface Water Storage, Sub/Surface Transfer, Sustain Trophic Structure, Nutrient Cycling, Chemical Regulation*								
	Hydrology, Biology, Water Quality		OBFlow		**Select yes or no from dropdown menu:** *(If there is no floodplain, leave blank)*	NO			0.00
F11 **Wetland Vegetation**	**Are there wetland indicator plants adjacent to the channel and/or in the floodplain within the PAA?** Determine if vegetation in the riparian area of the PAA has a wetland indicator status of obligate or facultative wet. *Functions informed: Sub/Surface Transfer, Maintain Biodiversity, Sustain Trophic Structure, Nutrient Cycling, Chemical Regulation*								
	Hydrology, Biology, Water Quality		WetVeg		Are there wetland indicator plant species within the PAA?	YES			1.00
					If yes, are any wetland indicator plants located greater than 0.5 x BFW from the bankfull edge on at least one side of the stream? (*Select N/A if you answered No above)*	YES			
					If yes, are the wetland indicator plants located beyond 0.5 x BFW distributed along >70% of the length of the PAA? *(Select N/A if you answered No above)*	YES			
F12 **Side Channels**	**What proportion of the EAA length has side channels?** Side channels include all open conveyances of water, even if the channel is plugged on one end. If both ends are plugged, do not count as a side channel. *Functions informed: Surface Water Storage, Sub/Surface Transfer, Maintain Biodiversity, Create & Maintain Habitat*								
	Hydrology, Biology		SideChan		**Enter a percentage**: *(round to nearest whole number)*	0			0.00
F13 **Lateral Migration**	**What percent of both sides of the channel within the EAA is constrained from lateral migration?** Constraints on lateral migration of the channel within 2 BFW or 50 feet (whichever is greater) include bank stabilization and armoring, bridges and culverts, diversions, roads paralleling the stream and any other intentional structures or features that limit lateral channel movement whether intentionally or not. For cross-channel structures (diversions, bridges, culverts, etc.), record 4x the BFW as the length constrained on both sides of the channel. For linear features, record the length on each side of the channel. For segmented bank features, such as bendway weirs or log jams acting in concert, record the effective length of stabilization on each side of the channel affected. It is acceptable to include relevant armoring that is recorded in the Bank Armoring question, below. *Functions informed: Sediment Continuity*								
	Geomorphology		LatMigr		**Enter a percentage:** *(round to nearest whole number)*	0			1.00
F14 **Wood**	**What is the frequency of large wood in the bankfull channel within the EAA?** Report the frequency (pieces per 328 feet [100m] of channel) of independent pieces of wood, defined here as woody material with a diameter of at least 4 inches (10cm) and a length of 5 feet (1.5m) within the EAA. This means that at least 5 feet of the piece of wood must be larger than 4 inches in diameter (i.e. a circumference > 12.5 inches). Independent pieces include all those individual pieces that meet size criteria either separate from or within log jams. To be counted, wood must have some part of its length within the bankfull channel. Exclude any wood that has been intentionally anchored to or within the channel banks (using spikes, cables, ballast, etc.) for the purpose of preventing bank erosion (armoring). *Functions informed: Surface Water Storage, Maintain Biodiversity, Create & Maintain Habitat*								
	Hydrology, Biology		Wood	WMTsmall	**Enter the frequency (pieces per 328 ft) of wood in the channel:** *(round to nearest hundredth)*	69.49			1.00

F15 **Incision**	**What is the degree of channel incision within the EAA?** As part of the longitudinal survey, at 11 evenly spaced locations along the stream within the EAA, measure the Bank Height Ratio (BHR). The BHR is the height from the stream thalweg to the lowest floodplain/terrace divided by the bankfull height. Do not consider inset floodplains. *Functions informed: Surface Water Storage, Sediment Continuity, Create & Maintain Habitat*								
	Hydrology, Geomorphology, Biology		Incision		**Enter the average incision:** *(round to nearest hundredth)*	2.00			0.38
F16 **Embeddedness**	**What is the degree of substrate embeddedness in the stream channel?** To what extent are larger stream substrate particles surrounded by finer sediments on the surface of the streambed? Measurements are taken at 11 transects within the EAA. *Functions informed: Flow Variation, Substrate Mobility, Create & Maintain Habitat*								
	Hydrology, Geomorphology, Biology		Embed		**Enter a percentage:** *(round to nearest whole number)*	100			0.00
F17 **Channel Bed Variability**	**Is the channel variable?** Channel bed variability indicators include variation in wetted channel width and stream thalweg depth along the EAA. *Functions informed: Surface Water Storage, Sub/Surface Transfer, Flow Variation, Sediment Continuity, Maintain Biodiversity, Create & Maintain Habitat, Nutrient Cycling, Chemical Regulation*								
	Hydrology, Geomorphology, Biology, Water Quality		BedVar		Enter the **wetted width** coefficient of variation:	0.00			0.00
					Enter the **thalweg depth** coefficient of variation:	0.31			0.29
							AVERAGE		0.14

STREAM FUNCTION ASSESSMENT METHOD for OREGON

Name of Project Area:	North Fork Cozine Creek (Proposed)	Assessment Timing:	Predicted conditions	Enter Data in These Boxes ONLY Scores Automatically Calculated in Green Boxes

VALUES MEASURES TABLE

FILL IN THE YELLOW BOXES. Most questions contain drop-down menus in their respective answer box. Select an answer from the drop-down menus, when possible, instead of typing an answer.

Measure	Function Groups	Submeasure	Measure Abbreviation	Qualifiers		Data Entry			Measure Score
V1 **Rare Species Occurrence & Special Habitat Designations**	**Are there rare species or special habitat designations in the vicinity of the PA?** Answer each submeasure using information from the site's SFAM report (rare species scores & special habitat designations section), as well as any available survey data for the PA and its vicinity, or personal knowledge about the site. Note: The SFAM Report provides rankings of High, Intermediate, Low, or None for each category of rare species associated with aquatic and riparian habitat. Upgrade a ranking to High if there is a recent (within 5 years) onsite observation of any of these species by a qualified observer under conditions similar to what now occur. Provide references in the external notes section of the cover page. *Values informed: Surface Water Storage, Flow Variation, Substrate Mobility, Maintain Biodiversity, Sustain Trophic Structure, Nutrient Cycling, Chemical Regulation, Thermal Regulation* **Essential salmonid habitat or rare non-anadromous fish species:**								
	Hydrology, Geomorphology, Biology, Water Quality	Fish	Fish		Is the PA within a HUC12 that has designated Essential Salmonid Habitat (ESH)? Select yes or no.	Yes			1.00
					According to the site's SFAM Report, what is the "non-anadromous fish" score? Select an answer from the dropdown menu:	None/Not Known			
	Rare amphibian and reptile species:								
	Hydrology, Geomorphology, Biology, Water Quality	Rare Amphibians and Reptiles	RarAmRep		According to the site's SFAM Report, what is the "amphibian and reptile" score? Select an answer from the dropdown menu:	Intermediate			0.50
	Important Bird Areas or rare waterbirds:								
	Biology, Water Quality	Waterbirds	Waterbird		Is there an Important Bird Area (IBA) within a 2-mile radius of the PA?	No			0.00
					According to the site's SFAM Report, what is the "feeding waterbird" score? Select an answer from the dropdown menu:	None/Not Known			
	Rare songbirds, raptors, and mammals:								
	Biology, Water Quality	Rare Bird and Mammals	RarBdMm		According to the site's SFAM Report, what is the "songbird, raptor and mammal" score? Select an answer from the dropdown menu:	None/Not Known			0.00
	Rare invertebrate species:								
	Hydrology, Geomorphology, Biology, Water Quality	Rare Invertebrates	RarInvert		According to the site's SFAM Report, what is the "invertebrates" score? Select an answer from the dropdown menu:	None/Not Known			0.00
	Rare plant species:								
	Geomorphology, Biology, Water Quality	Rare Plants	RarPlant		According to the site's SFAM Report, what is the "plant" score? Select an answer from the dropdown menu:	Intermediate			0.50
V2 **Water Quality Impairments**	**Is this reach on the 303(d) list or other TMDL (Categories 3B-5) for any of the following impairments: sediment, nutrient, metals & toxics, temperature, or flow modification?** Answer each submeasure using information from the site's SFAM Report (water quality impairments section). *Values informed: Flow Variation, Sediment Continuity, Create & Maintain Habitat, Sustain Trophic Structure, Nutrient Cycling, Chemical Regulation, Thermal Regulation*								
	Sediment impairment: total suspended solids (TSS), sedimentation, or turbidity (note that some sedimentation can be naturally occurring and desirable therefore does not constitute a problem)								
	Geomorphology, Water Quality	Sedimentation	SedList		Select yes or no from the dropdown menu:	No			0.00
	Nutrient impairment: phosphorus, nitrate, ammonia, DO, aquatic weeds or algae, chlorophyll a, etc.; or untreated stormwater/wastewater discharge occurs within 500 feet of the reach								
	Biology, Water Quality	Nutrient Impairment	NutrImp		Select yes or no from the dropdown menu:	No			0.00
	Metals or other toxics impairment: toxics, dioxin, heavy metals (iron, manganese, lead, zinc, etc.); or untreated stormwater/wastewater discharge occurs within 500 feet of the reach								
	Water Quality	Metals & Toxics Impairment	ToxImp		Select yes or no from the dropdown menu:	No			0.00
	Temperature impairment:								
	Biology, Water Quality	Temperature Impairment	TempImp		Select yes or no from the dropdown menu:	No			0.00
	Flow modification:								
	Hydrology, Biology	Flow Modification	FlowMod		Select yes or no from the dropdown menu:	No			0.00

V3 **Protected Areas**	**Is the PA boundary within 300 feet of a special protected area?** Answer using information from the site's SFAM Report (Within 300 feet of a Special Protected Area) as well as other available data for the PA and its vicinity. Note: The SFAM Report evaluates whether BLM Areas of Critical Environmental Concern (ACEC) or Outstanding Natural Areas (ONA), federal Research Natural Areas (RNA) or Special Interest Areas (SIA), Natural Heritage Conservation Areas (NHCA), and Land Trust and Nature Conservancy Preserves are within 300 feet of the PA. If there are other lands within 300 feet of the site that are protected specifically for their high ecological significance, select yes and provide references in the assessment notes section of the cover page. *Values informed: Maintain Biodiversity, Sustain Trophic Structure*								
	Biology		Protect		Select yes or no from the dropdown menu:	No			0.00
V4 **Impervious Area**	**What is the percent impervious area in the drainage basin?** Answer using information from the site's StreamStats Report (IMPERV). *Values informed: Surface Water Storage, Flow Variation, Sediment Continuity, Substrate Mobility, Create & Maintain Habitat, Sustain Trophic Structure, Nutrient Cycling, Chemical Regulation, Thermal Regulation*								
	Hydrology, Geomorphology, Biology, Water Quality		ImpArea		<10%, select A; 10-25%, select B; >25-60%, select C; >60%, select D.	D			1.00
V5 **Riparian Area**	**What is the percentage of intact riparian area within 2 miles upstream of the PA ?** Intact refers to a riparian area with forest or otherwise unmanaged (i.e. natural) perennial cover appropriate for the basin that is at least 15 ft wide on both sides of the channel. Unmanaged perennial cover is vegetation that includes wooded areas, native prairies, sagebrush, vegetated wetlands, as well as relatively unmanaged commercial lands in which the ground and vegetation is disturbed less than annually, such as lightly grazed pastures, timber harvest areas, and rangeland. It does not include water, pasture, row crops (e.g., vegetable, orchards, Christmas tree farms), lawns, residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads. *Values informed: Create & Maintain Habitat, Sustain Trophic Structure, Nutrient Cycling, Chemical Regulation, Thermal Regulation*								
	Biology, Water Quality		RipArea		If >50% select A. If >35-50%, select B. If 15-35%, select C. If <15%, select D.	D			0.00
V6 **Extent of Downstream Floodplain Infrastructure**	**What is the extent of infrastructure (buildings, bridges, utilities, row crops) in the floodplain ?** Consider the floodplain area between the PA and either the next largest water body (large tributary, mainstem junction, lake, etc.) or 2 miles downstream, whichever is less. *Values informed: Surface Water Storage, Sediment Continuity, Create & Maintain Habitat, Sustain Trophic Structure*								
	Hydrology, Geomorphology, Biology		DwnFP		If >50% of total area, select A. If 1-50% of total area, select B. If none, select C. If not known or the downstream floodplain is not mapped, select D.	D			0.00
V7 **Zoning**	**What is the dominant zoned land use designation downstream of the PA?** Consider the floodplain area between the PA and either the next largest water body (larger tributary, mainstem junction, lake, etc.) or 2 miles downstream, whichever is less. *Values informed: Surface Water Storage, Create & Maintain Habitat, Sustain Trophic Structure*								
	Hydrology, Biology		Zoning		If developed (commercial, industrial, residential, etc.), select A. If agriculture or rural residential, select B. If forest, open space, or public lands, select C. If not zoned or no information, select D.	A			1.00
V8 **Frequency of Downstream Flooding**	**What is the frequency of downstream flooding?** Consider the floodplain area between the PA and either the next largest water body or 2 miles, whichever is less. Determine the frequency of flooding downstream of the PA that affects infrastructure (i.e. affects use of the site or causes economic loss). *Values informed: Surface Water Storage*								
	Hydrology		DwnFld		If frequent (several times a year), select A. If moderate (up to once a year), select B. If infrequent (only large events), select C. If never or not known, select D.	D			0.00

V9

Impoundments

What is the prevalence of impoundments within 2 miles upstream and downstream of the PA that are likely to cause shifts in timing or volume of water?

The shift may be by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). For each category, select yes or no from the dropdown menu.

Values informed: Surface Water Storage, Flow Variation, Sediment Continuity, Substrate Mobility, Create & Maintain Habitat; Functions informed: Flow Variation

Hydrology, Geomorphology, Biology		Impound		Are there 1-2 small dams or other impoundments **upstream** of the PA?	No	Upstream impoundments subscore:	1.00
				Are there >2 small impoundments, 1 or more large dams or other impoundments **upstream** of the PA?	No		
				Are there 1-2 small dams or other impoundments **downstream** of the PA?	Yes	Downstream impoundments subscore:	0.50
				Are there >2 small impoundments, 1 or more large dams or other impoundments **downstream** of the PA?	No		

V10

Fish Passage Barriers

Are there man-made fish passage barriers within 2 miles upstream and/or downstream of the PA ?

Select an answer from the drop-down menu for each of the upstream and downstream directions. If more than one barrier is present, answer for the one with the most restricted level of passage (e.g. Blocked). Do not include natural barriers.

Values informed: Maintain Biodiversity, Sustain Trophic Structure

Biology		Passage	Slope barrier	Upstream	Blocked	0.00		0.00
				Downstream	Blocked	0.00		

V11

Water Source

Is there an area that is of special concern for drinking water sources or groundwater recharge within 2 miles downstream of the PA?

This includes any of the following: the source area for a surface-water drinking water source; the source area for a groundwater drinking water source; a designated Groundwater Management Area; a designated Sole Source Aquifer.

Values informed: Sub/Surface Transfer, Nutrient Cycling, Chemical Regulation

Hydrology, Water Quality		Source		Select yes or no from the dropdown menu:	Yes			1.00

V12

Surrounding Land Cover

What are the land cover types surrounding the PA?

Draw a 2 mile radius around the PA. Provide an estimate of the percentage of area within the resulting polygon that matches each land cover description. Enter 0% if none. Enter 1% if barely present. Must sum to 100%.

Values informed: Maintain Biodiversity, Sustain Trophic Structure

Biology		SurrLand		Unmanaged vegetation (wetland, native grassland, forest) or water	5	× 1.00	5.00	0.30
				Managed vegetation (pasture, regularly watered lawn (i.e. park), row crops, orchards)	50	× 0.50	25.00	
				None of the above (including bare areas [dirt, rock], roads, energy facilities, residential, commercial, industrial)	45	× 0.00	0.00	
				SUM	100			

V13

Riparian Continuity

What is the longitudinal extent of intact riparian area that is contiguous to the PA?

Select the longest length of contiguous riparian corridor in either the upstream or downstream direction, but do not include the PA length itself.

Intact refers to a riparian area with forest or otherwise managed (i.e. natural) perennial cover appropriate for the basin that is at least 15 ft wide on both sides of the channel. Contiguous means there are no > 100 ft gaps in forested cover or unmanaged perennial cover. Unmanaged perennial cover is vegetation that includes wooded areas, native prairies, sagebrush, vegetated wetlands, as well as relatively unmanaged commercial lands in which the ground and vegetation is disturbed less than annually, such as lightly grazed pastures, timber harvest areas, and rangeland. It does not include water, pasture, row crops (e.g., vegetable, orchards, Christmas tree farms), lawns, residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads.

Values informed: Maintain Biodiversity, Create & Maintain Habitat, Sustain Trophic Structure, Nutrient Cycling, Chemical Regulation, Thermal Regulation

Biology, Water Quality		RipCon		If <100 feet, select A. If 100-500 feet, select B. If >500 feet, select C.	B			0.50

V14

Watershed Position

What is the relative position of the PA in its HUC 8 watershed?

Answer this question looking at position of the PA releative to the 8-digit HUC layer.

- If the PA is (a) closer to the watershed's outlet than its upper end and (b) closer to the large stream/river exiting the watershed's outlet than it is to the boundary of the watershed, select "lower 1/3."
- If the PA is (a) closer to the watershed's upper end than its outlet and (b) closer to the watershed's boundary than its large stream/river, select "upper 1/3."
- If neither of the above conditions are met, select "middle 1/3."

Values informed: Sediment Continuity, Nutrient Cycling, Chemical Regulation

Geomorphology, Water Quality		Position		Select an answer from the dropdown menu:	Lower 1/3			1.00

V15 **Flow Restoration Needs**	**What is the "streamflow restoration need" ranking of the watershed within which the PA is located?** Answer this question using the Flow Restoration Needs layer in the SFAM Map Viewer. *Values informed: Flow Variation, Create & Maintain Habitat*								
	Hydrology, Biology		FlowRest		Select an answer from the dropdown menu:	Moderate			0.50
V16 **Unique Habitat Features**	**Are there rare aquatic habitat features within the EAA that are not common to the rest of the drainage basin ?** For each feature type, select yes or no from the dropdown menu. This question must be answered in the field, but the user can check for any mapped wetlands or seeps, springs, or tributaries in the office using the Oregon Wetlands Cover, Springs, and the Flowline layers, respectively. *Values informed: Substrate Mobility, Maintain Biodiversity, Create & Maintain Habitat, Sustain Trophic Structure, Thermal Regulation*								
	Geomorphology, Biology		HabFeat		Large log jams that span 25% or more of the active channel width?	No		Overall HabFeat score	0.00
					Braided channel or otherwise multiple channels resulting in islands?	No			
					Large spatial extent (>30%) of wetlands in the floodplain?	No		Substrate subscore	0.00
					Seeps, springs, or tributaries contributing colder water?	No		Thermal subscore	0.00
Already in Stream Classification on Cover Page - NO DATA INPUT REQUIRED.									
Surface Water Runoff	**What is the level of surface water runoff (based on local water availability and local gradient)?** No data input necessary, information taken from EPA classification (stream type & gradient).								
	Hydrology		Runoff						1.00
Aquifer Permeability	**What is the permeability of the aquifer (determined by percent permeable bedrock based on hydraulic conductivity m/day)?** No data input necessary, information taken from EPA classification.								
	Hydrology		AqPerm			High			0.00
Soil Permeability	**What is the permeability of the soil (based on hydraulic conductivity in cm/hr)?** No data input necessary, information taken from EPA classification.								
	Hydrology		SoilPerm			High			0.00
Erodibility	**What is the erodibility of this reach?** No data input necessary, information taken from EPA classification.								
	Geomorphology		Erode			Easily Erodible			1.00

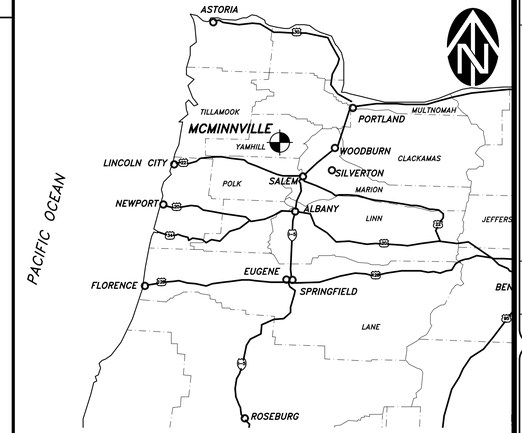
DRAWINGS FOR:

ELYSIAN SUBDIVISION
PHASE I & II

FOR:

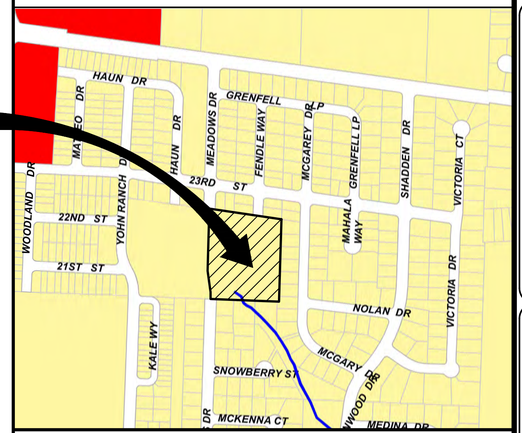
DON JONES
VJ-2 DEVELOPMENT INC.
695 COMMERCIAL STREET SE STE 006
SALEM, OR 97301

PROJECT LOCATION



VICINITY MAP

PROJECT LOCATION



SHEET INDEX

811
Know what's **below.**
Call before you dig.

BY	DESCRIPTION	NO.	DATE
	REVISIONS	1	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"
IF NOT ONE INCH, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 06/22/2022

REVIEW REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 2007
WILLIAM T. WELLS
RENEWS: 6/30/2022

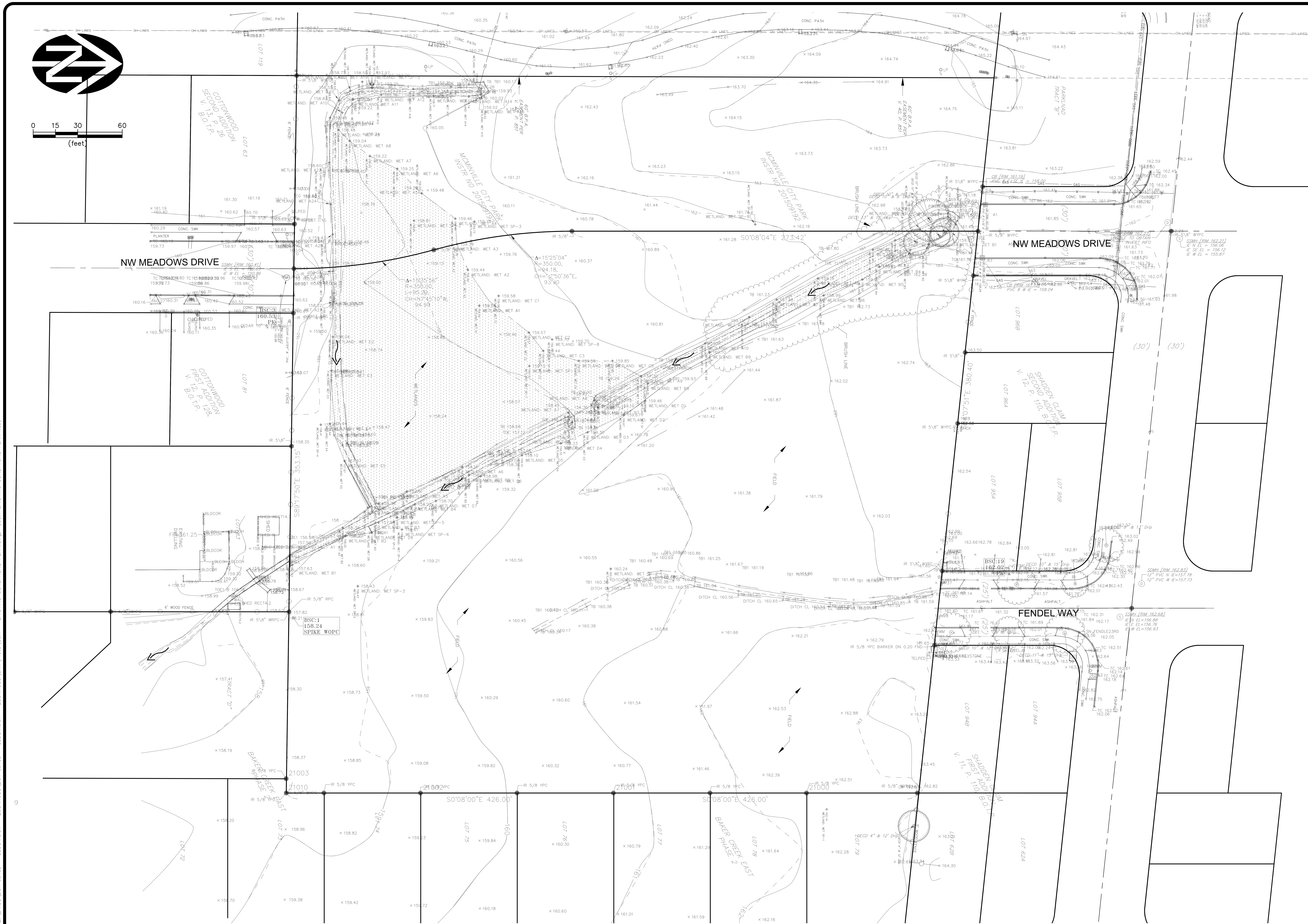
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

COVER SHEET, INDEX, AND VICINITY MAP

DRAWING
C0.0

JOB NUMBER
2931.0000.0



VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN.	JW
DRN.	IH
CKD.	JW
DATE:	8/1/2022

NO.	DATE	DESCRIPTION	BY
1			
		REVISIONS	

REVIEW

REGISTERED PROFESSIONAL ENGINEER 67157 OREGON NOV. 12, 2008 WILLIAM J. WELLS

RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT

ELYSIAN SUBDIVISION

EXISTING CONDITIONS PLAN

DRAWING

C0.1

JOB NUMBER

2931.0000.0

1/25/2022 4:40:38 PM
E:\DWGS\Don Jones - Subdivision - 2931.1000\Civil\Plots\C0.1 - EXISTING CONDITIONS PLAN.dwg, (C0.1 EXISTING CONDITIONS PLAN tab)

LEGEND	
- - - - -	BUILDING FOOTPRINT

Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C11	95.29	350.00	15.60	S7° 45' 10"E	94.99
C12	94.18	350.00	15.42	S7° 50' 36"E	93.90

● = CONTRACTOR TO SET C/L MONUMENTS. (8"x8" WASHINGTON COUNTY RING & COVER OR EQUAL).

NOTES:
1. 5FT SIDE-YARD SETBACK PROPOSED ON ALL LOTS.

LOT SUMMARY

MIN = 5436 SF
MAX = 8363 SF
AVG = 6294 SF

EXISTING ZONES: R-1

GROSS AREA: 3.79 ACRES

NET AREA: 3.03 ACRES
(W/OUT ROW)

TL: 4 418 TL 204

PHASE II
PHASE I
PHASE BOUNDARY
EXTG. SAN.
EXTG. 8" WATER
NW MEADOWS DRIVE
NW FENDLE WAY
6' WOOD FENCE
3' RAIL FENCE
BARRICADE
ASPH
CONC SWK
ELEC JB
60' B.P.A. EASEMENT PER V. 40, P. 851
0.82%
30' DEDICATION BY OWNER
30' DEDICATION BY CITY OF MCMINNVILLE
10' PUE
R.O.W.
BUILDING FOOTPRINT
LOT 1 AREA: 6940 S.F.
LOT 2 AREA: 6424 S.F.
LOT 3 AREA: 6422 S.F.
LOT 4 AREA: 6420 S.F.
LOT 5 AREA: 6267 S.F.
LOT 6 AREA: 6340 S.F.
LOT 7 AREA: 6358 S.F.
LOT 8 AREA: 5748 S.F.
LOT 9 AREA: 6287 S.F.
LOT 10 AREA: 6500 S.F.
LOT 11 AREA: 6500 S.F.
LOT 12 AREA: 5974 S.F.
LOT 13 AREA: 5992 S.F.
LOT 14 AREA: 5473 S.F.
LOT 15 AREA: 5475 S.F.
LOT 16 AREA: 5436 S.F.
LOT 17 AREA: 6365 S.F.
LOT 18 AREA: 8363 S.F.
10' PUBLIC SS EASEMENT
10' PUBLIC STORM EASEMENT
BENCH
6' PUE
10' DRAINAGE EASEMENT
PUBLIC UTILITIES AND ACCESS EASEMENT
TRACT A OPEN SPACE AREA=15,086 SF TOTAL AREA=16,925 SF
10' WIDE PEDESTRIAN CONNECTION
20' PUBLIC ACCESS EASEMENT
4' TALL BLACK VINYL FENCE
12' WIDE GATE
PROTECTED WETLANDS
WETLAND AREA
21000
21001
21002
21010
0 15 30 60
(feet)

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

DSN. JW
DRN. AK
CKD. JW
DATE: 05/20/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 12, 1983 WILLIAM T. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
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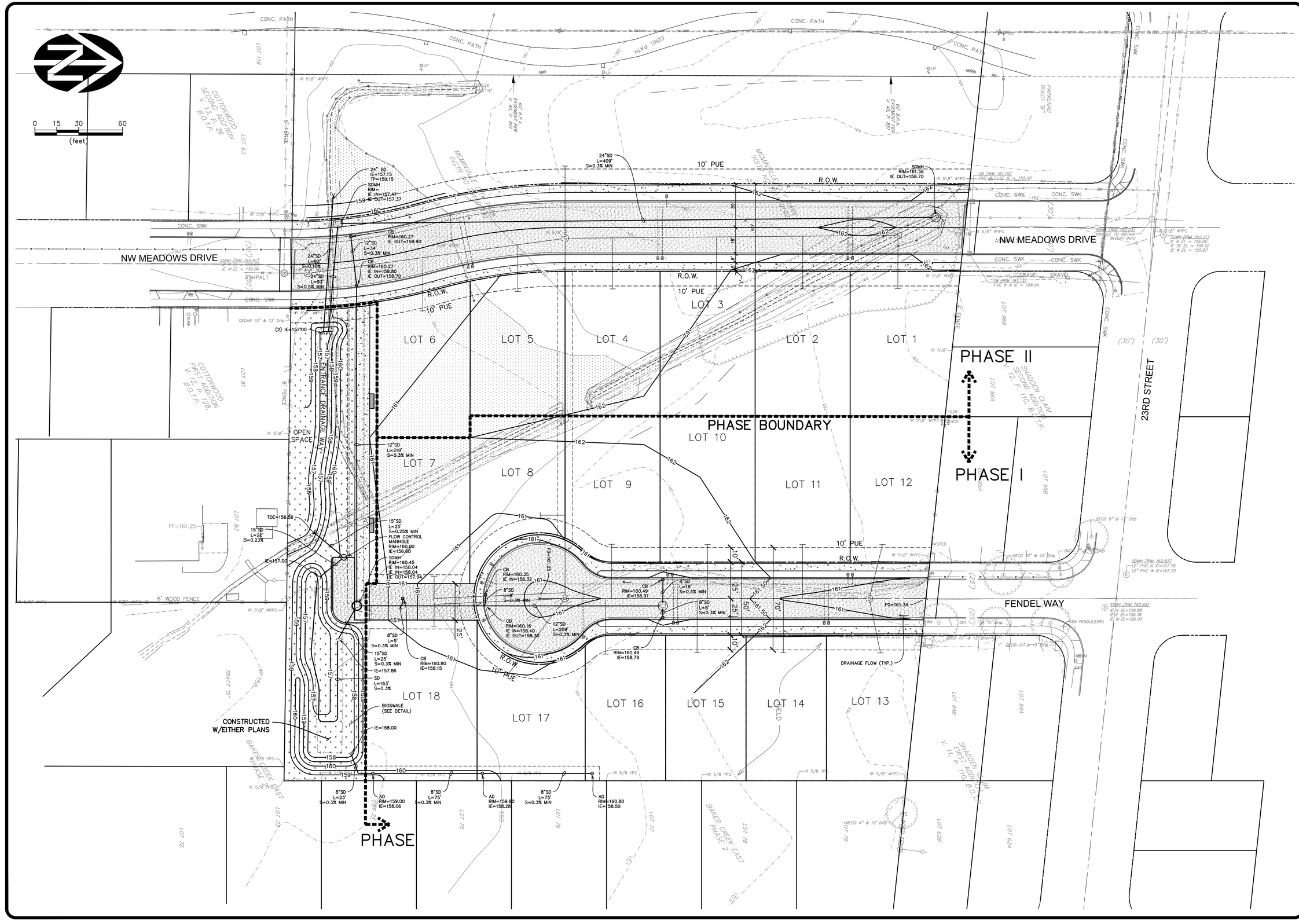
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

OVERALL SUBDIVISION PLAN

DRAWING
C2.0

JOB NUMBER
2931.0000.0



VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

DSN. JW
DRN. IH/AK
CKD. JW
DATE: 05/20/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 1979
WILLIAM L. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
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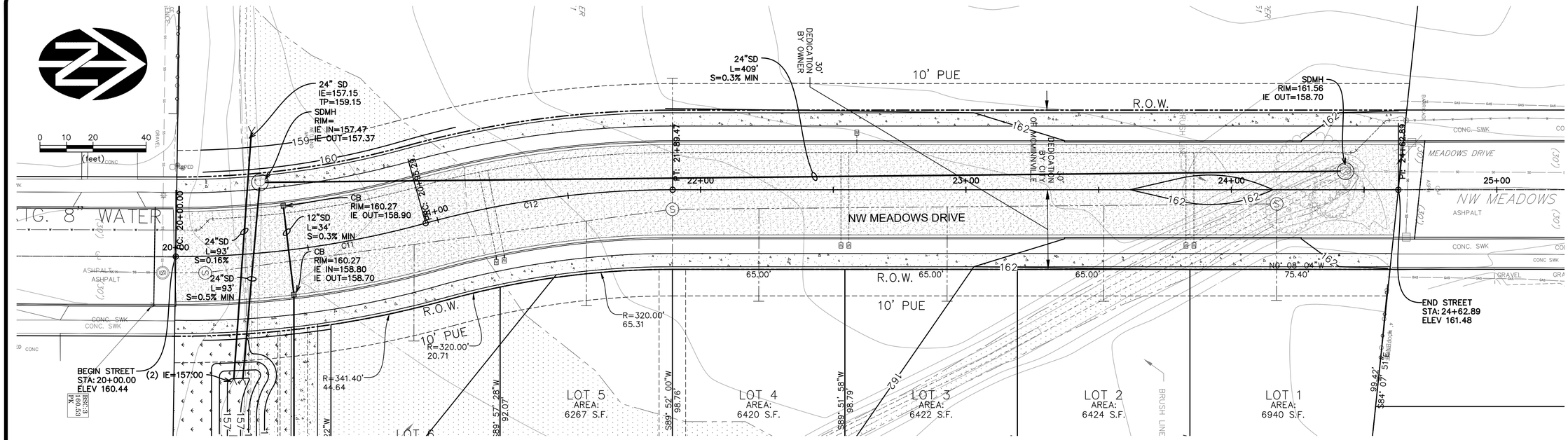
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

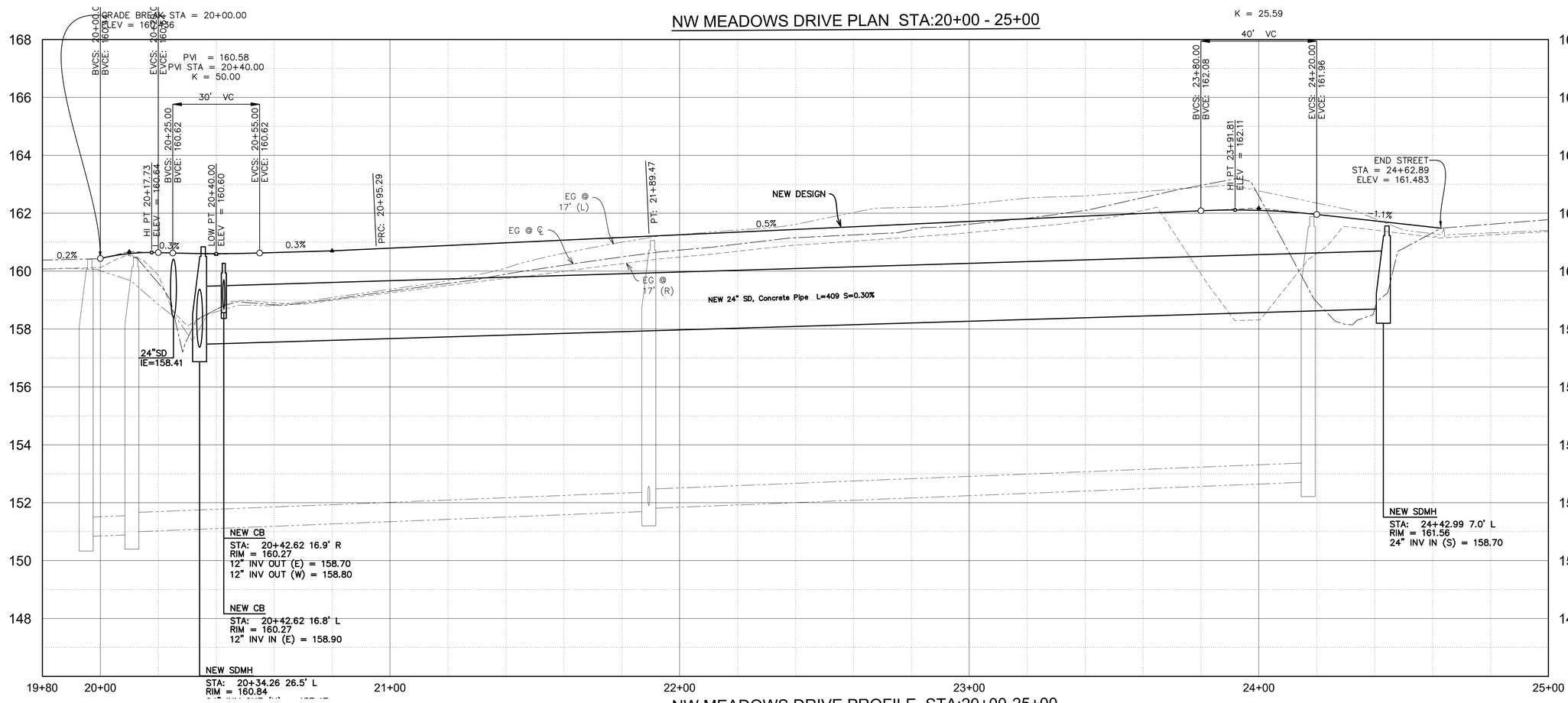
OVERALL GRADING AND DRAINAGE PLAN

DRAWING
C3.0

JOB NUMBER
2931.0000.0



NW MEADOWS DRIVE PLAN STA:20+00 - 25+00



NW MEADOWS DRIVE PROFILE STA:20+00-25+00

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. AK/IH
CKD. JW
DATE: 05/20/2022

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 1976
WILLIAM T. WELLS
RENEWS: 6/30/2022

REVIEW

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
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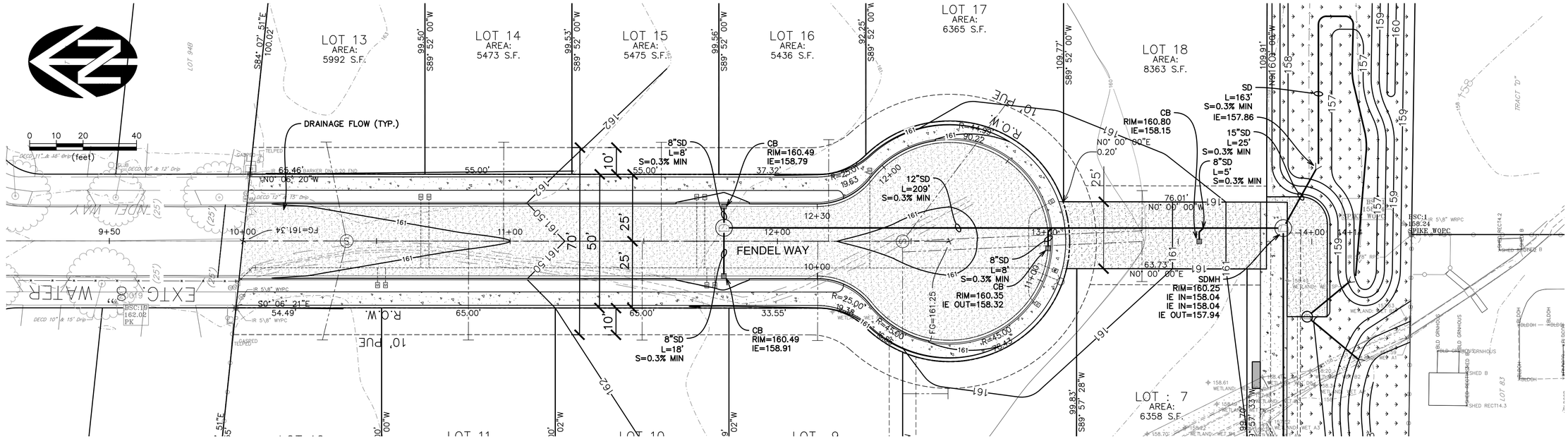
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

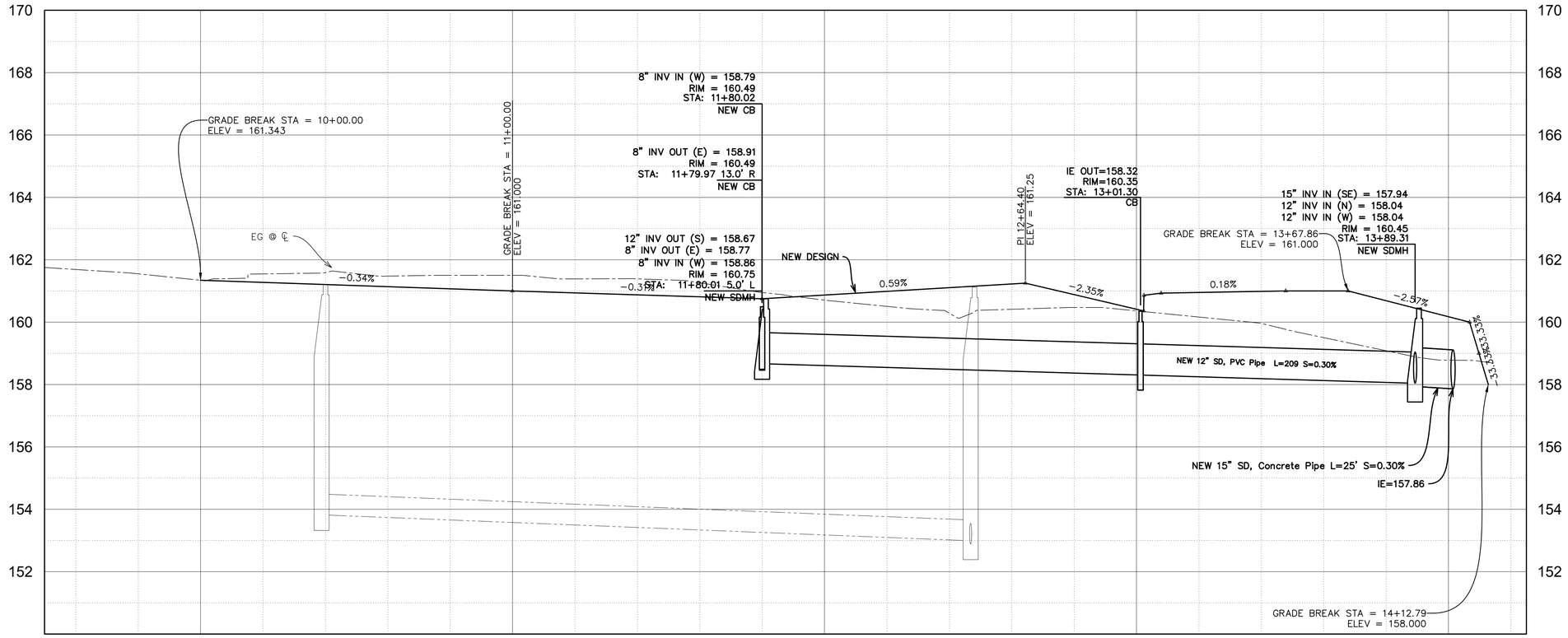
MEADOWS STREET PLAN AND PROFILE

DRAWING
ST-1

JOB NUMBER
2931.0000.0



NW MEADOWS DRIVE PLAN STA:10+00 - 14+14.40



NW MEADOWS DRIVE PROFILE STA:10+00-14+14.40

BY	DESCRIPTION	NO.	DATE
	REVISIONS	1	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 05/20/2022

REVIEW
REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 1979
WILLIAM T. WELLS

RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
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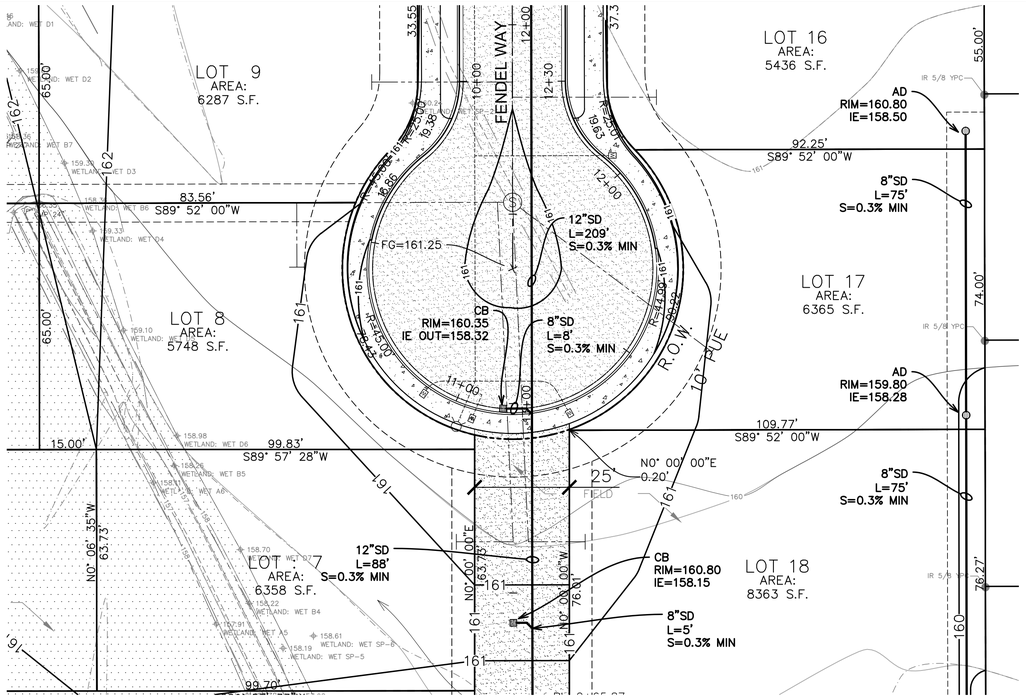
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

FENDEL WAY PLAN AND PROFILE

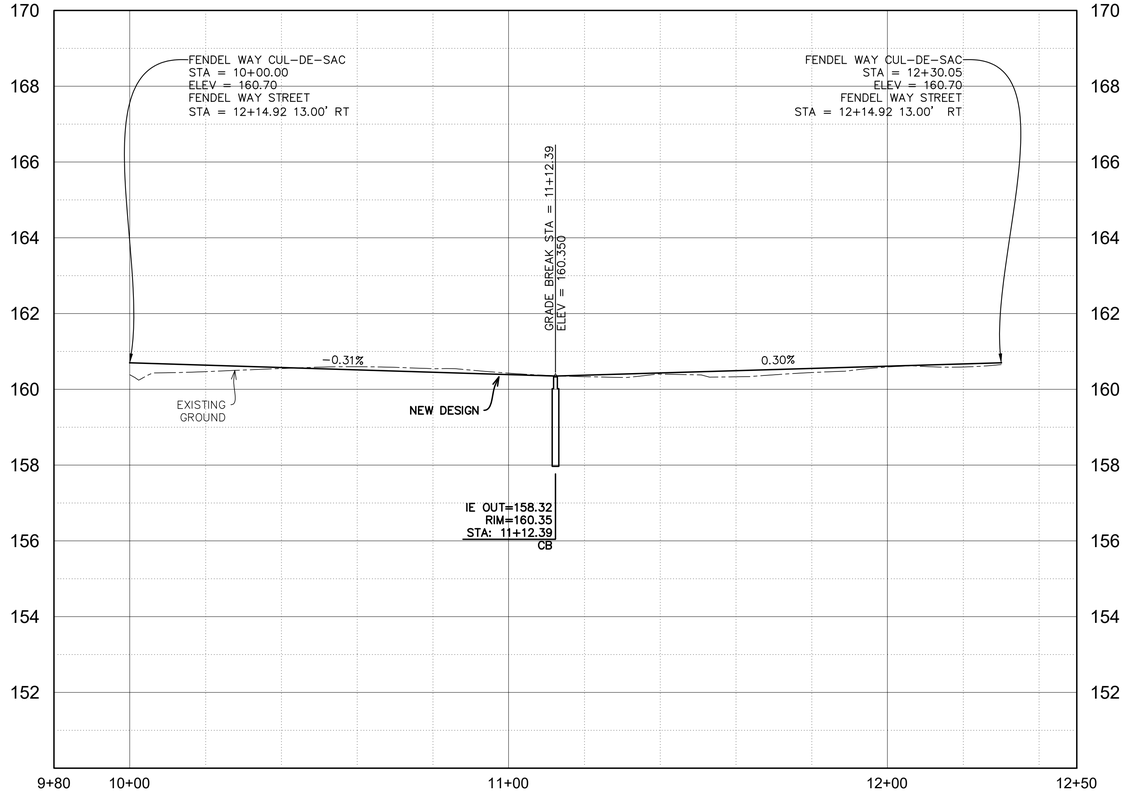
DRAWING
ST-2

JOB NUMBER
2931.0000.0

0 10 20 40
(feet)



FENDEL WAY PLAN STA:10+00 - 12+30.05



FENDEL WAY PROFILE STA:10+00 - 12+30.05

BY	DESCRIPTION	NO.	DATE
	REVISIONS	1	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 05/20/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 2005
WILLIAM T. WELLS

RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
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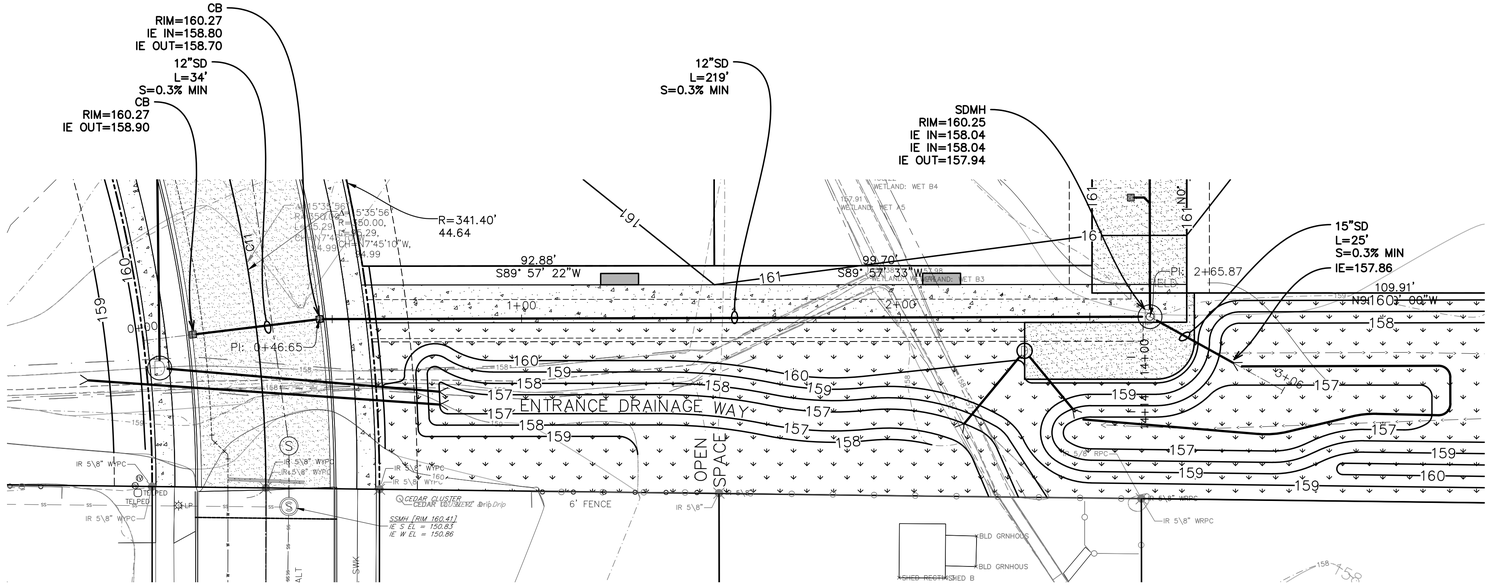
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

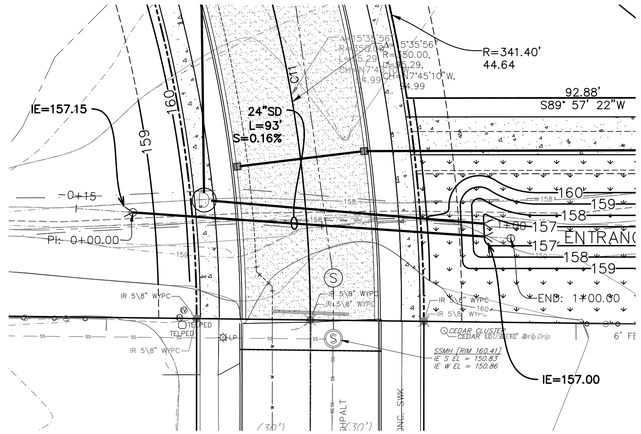
FENDEL WAY CUL-DE-SAC PLAN AND PROFILE

DRAWING
ST-3

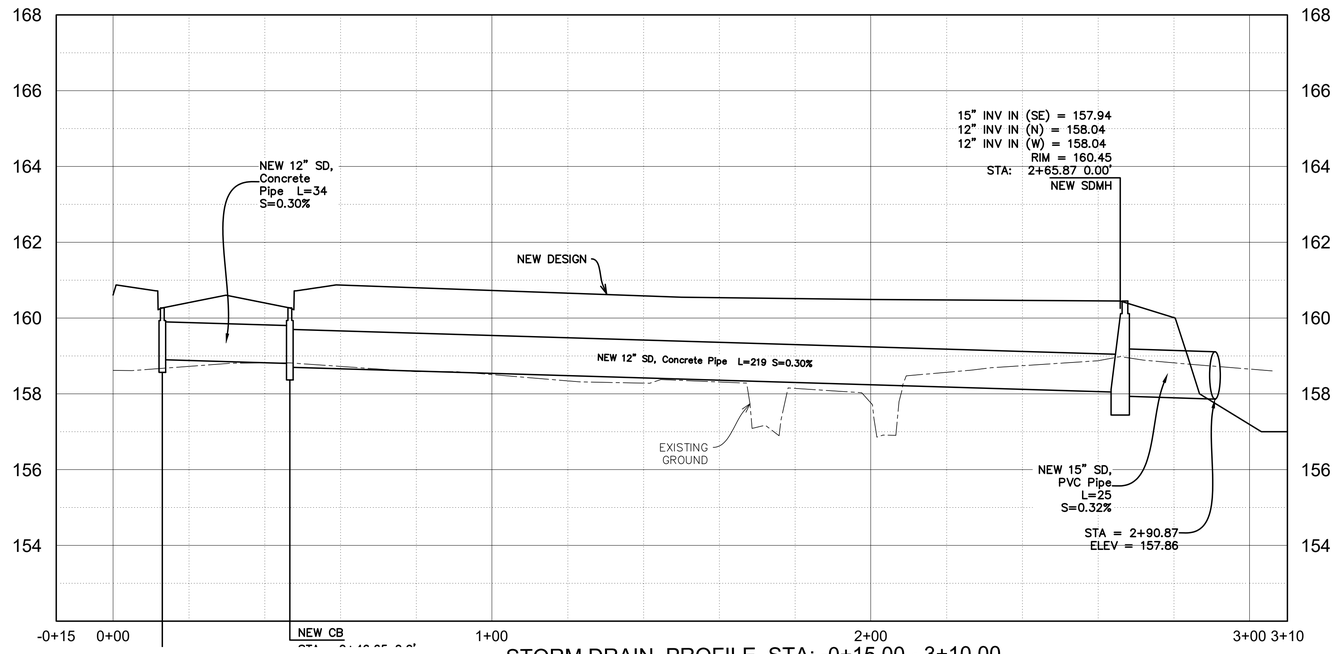
JOB NUMBER
2931.0000.0



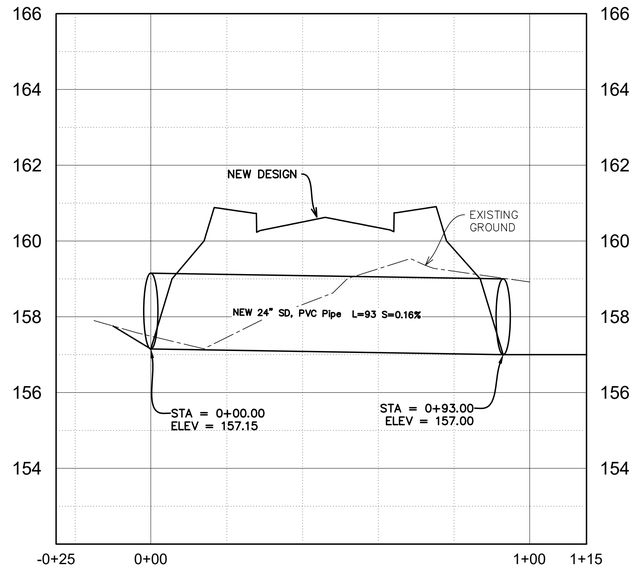
STORM DRAIN PROFILE STA: -0+15.00 - 3+10.00



STORM DRAIN PROFILE STA: -0+25.00 - 1+15.00



STORM DRAIN PROFILE STA: -0+15.00 - 3+10.00



STORM DRAIN PROFILE STA: -0+25.00 - 1+15.00

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, ADJUST THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 05/20/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 2010
WILLIAM T. WELLS

RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
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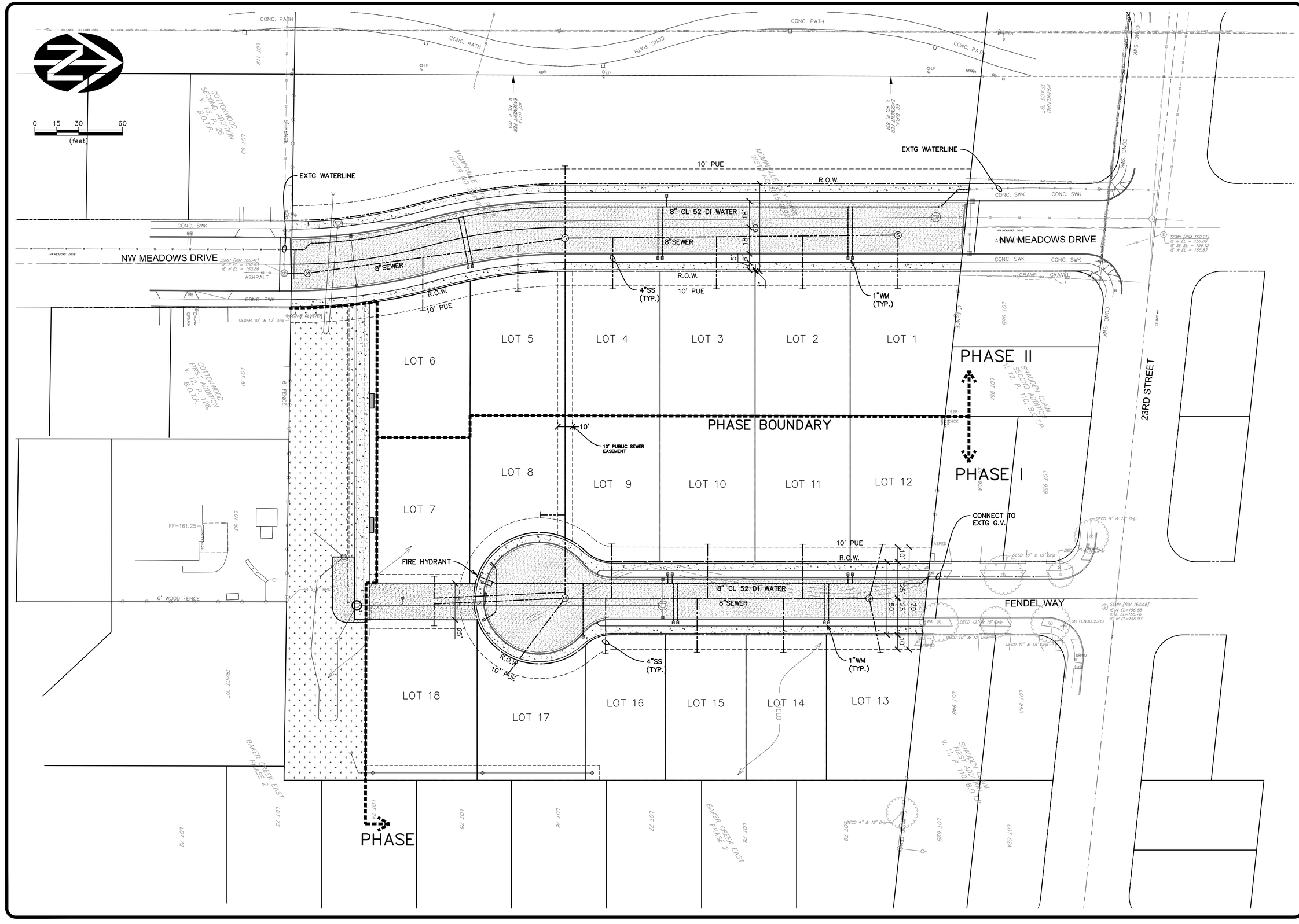
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

STORM DRAIN PLAN & PROFILE

DRAWING
ST-4

JOB NUMBER
2931.0000.0



NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, DO THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 06/22/2006

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON JULY 27, 1978
WILLIAM T. WELLS

RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
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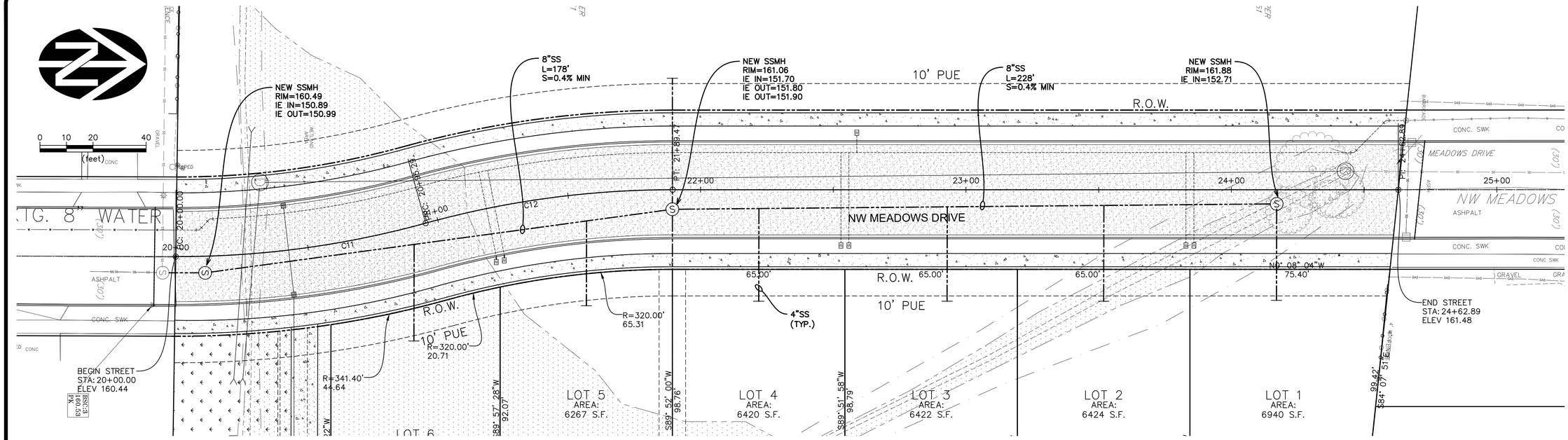
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

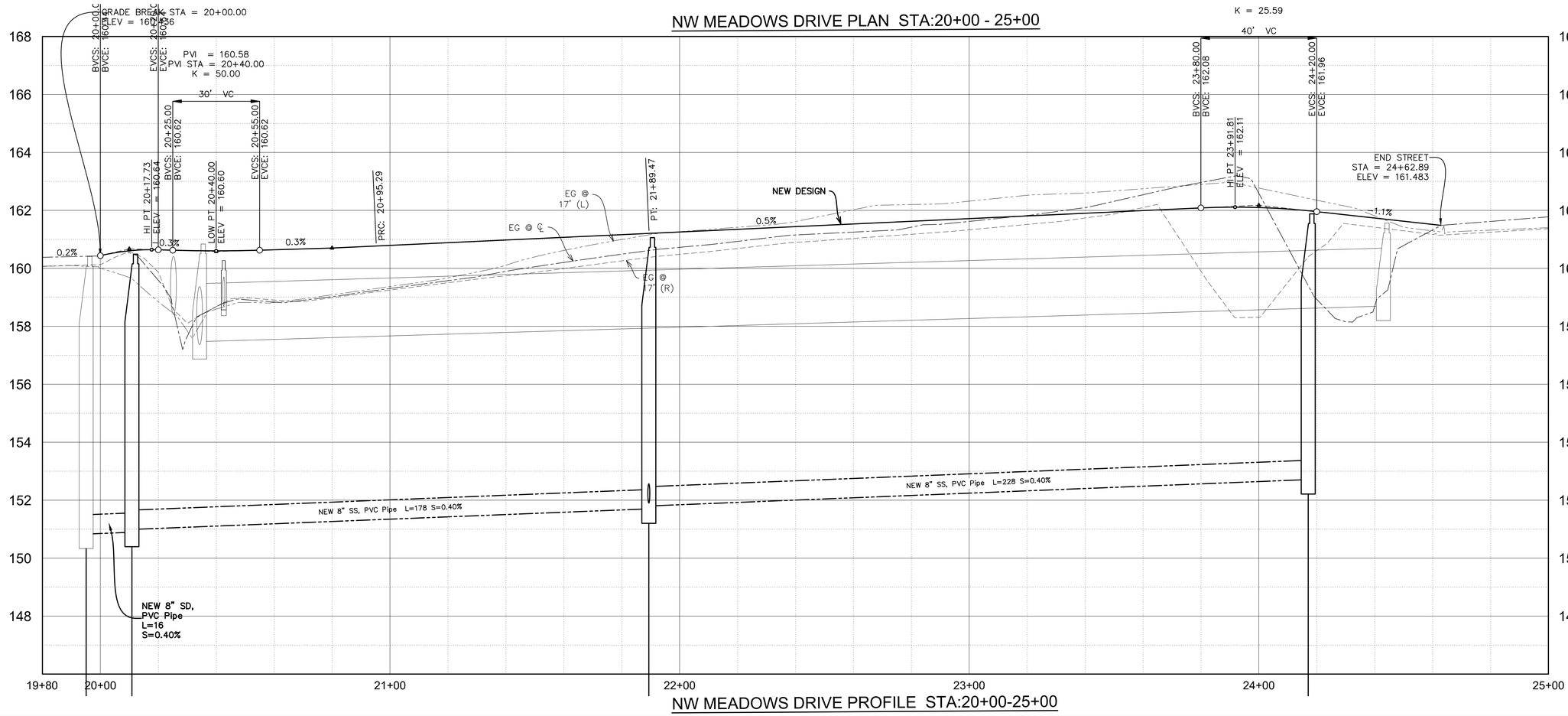
OVERALL UTILITY PLAN

DRAWING
C4.0

JOB NUMBER
2931.0000.0



NW MEADOWS DRIVE PLAN STA:20+00 - 25+00



NW MEADOWS DRIVE PROFILE STA:20+00-25+00

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

NO.	DATE	DESCRIPTION REVISIONS	BY
1			

DSN. JW
DRN. IH
CKD. JW
DATE: 8/5/2022

REGISTERED PROFESSIONAL ENGINEER
WILLIAM T. WELLS
OREGON
RENEWS: 6/30/2022

REVIEW

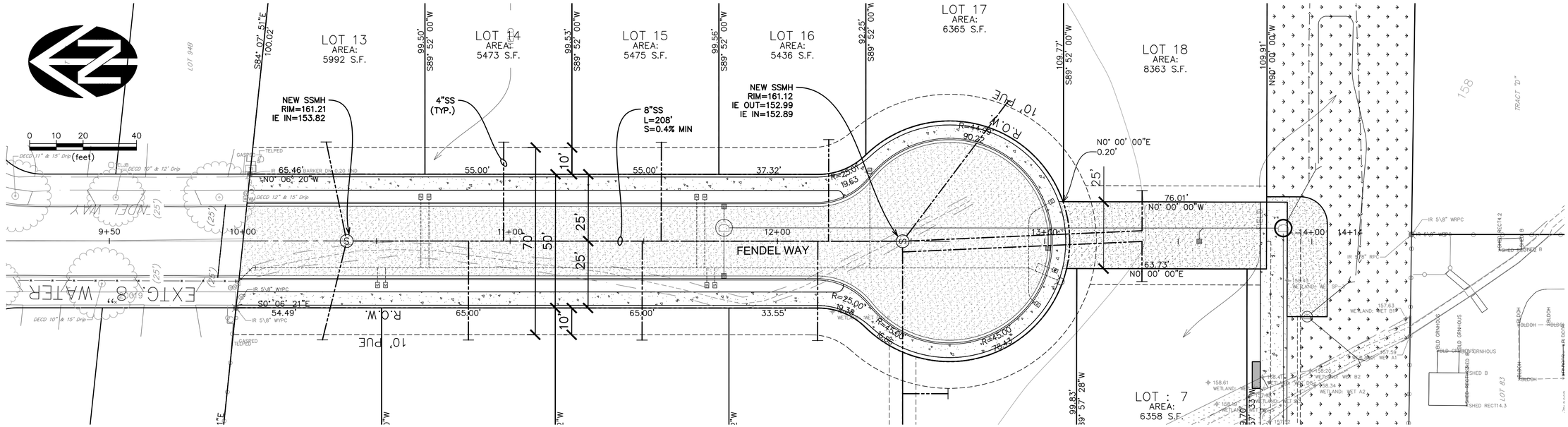
WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

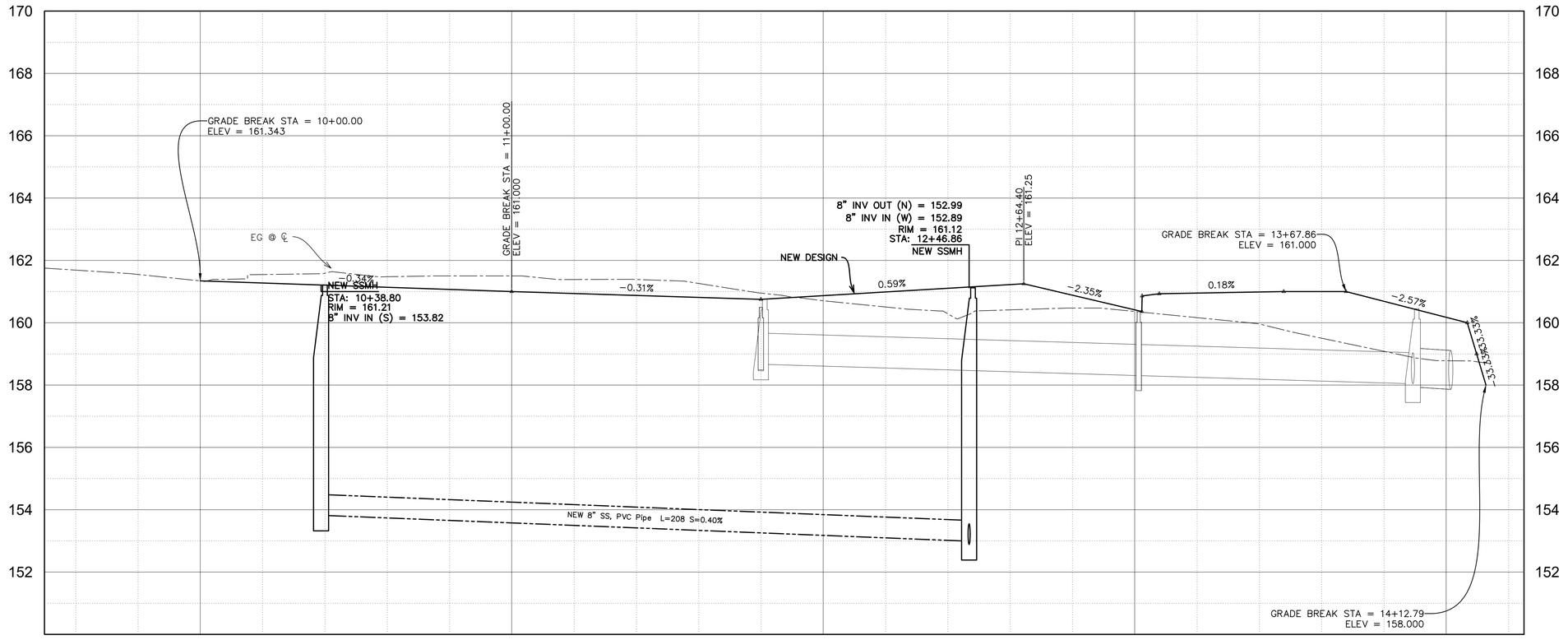
MEADOWS SANITARY SEWER PLAN AND PROFILE

DRAWING
SS-1

JOB NUMBER
2931.0000.0



FENDEL WAY PLAN STA:10+00 - 12+64.40



FENDEL WAY PROFILE H:1"=10' V:1"=1'

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, DO THIS SHEET, ADJUST SCALES ACCORDINGLY

NO.	DATE	DESCRIPTION	BY
1		REVISIONS	

DSN. JW
DRN. IH
CKD. JW
DATE: 6/30/2022

REVIEW REVIEW

REGISTERED PROFESSIONAL ENGINEER
WILLIAM T. WELLS
EXPIRES: 12/31/2023

RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
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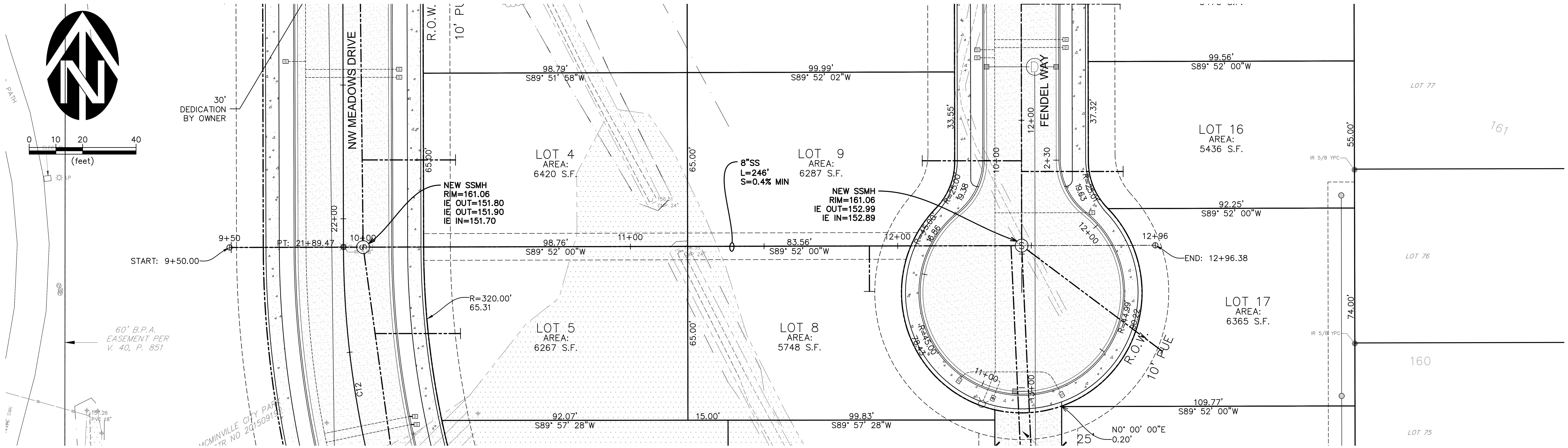
VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

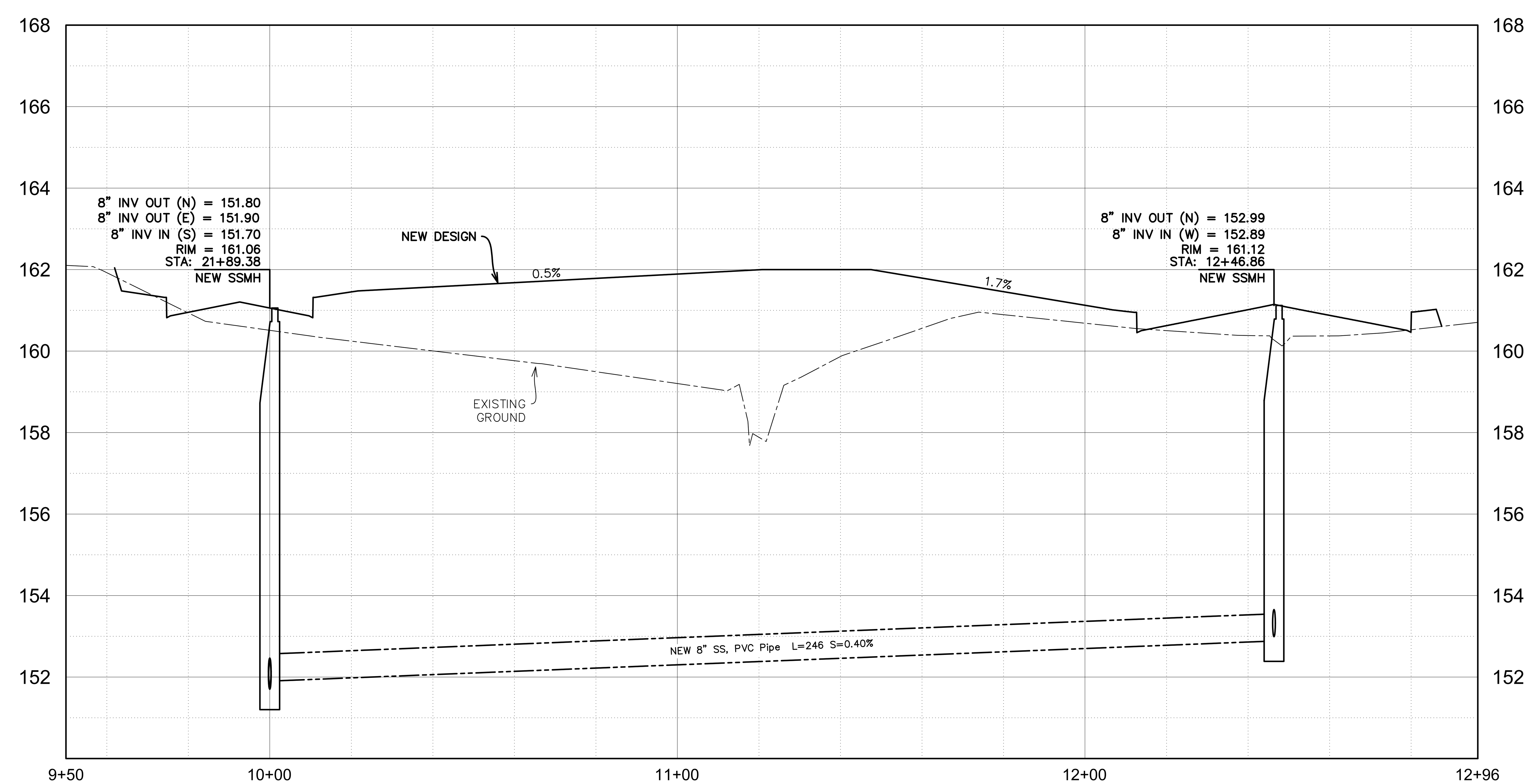
FENDEL WAY SANITARY SEWER PLAN AND PROFILE

DRAWING
SS-2

JOB NUMBER
2931.0000.0



SANITARY SEWER PLAN STA:10+00 - 12+46.38



SANITARY SEWER PROFILE H:1"=10' V:1"=1'

NO.	DATE	DESCRIPTION	BY
1			

REVISIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 01/2/2008

REVIEW

REGISTERED PROFESSIONAL ENGINEER 61515 OREGON NOV. 12, 2008 WILLIAM J. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
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E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

SANITARY SEWER MEADOWS DRIVE AND FENDEL WAY

DRAWING
SS-3

JOB NUMBER
2931.0000.0

0 15 30 60
(feet)

CONC. PATH
CONC. PATH
CONC. PATH
CONC. PATH
CONC. PATH
LOT 119
COTTONWOOD SECOND ADDITION V. 13, P. 26 B.C.T.P.
LOT 63
6' FENCE
60' B.P.A. EASEMENT PER V. 401, P. 851
60' B.P.A. EASEMENT PER V. 401, P. 851
PARKMAD TRACT 'B'
CONC. SWK
EXTG WATERLINE
MONMOUTH NO. 1 ANNEXATION
MONMOUTH NO. 2 ANNEXATION
10' PUE
R.O.W.
8" CL 52 DI WATER
CONC. SWK
CONC. SWK
EXTG WATERLINE
NW MEADOWS DRIVE
SSMH [RIM 160.41] IE S EL = 150.66 IE W EL = 150.86
NW MEADOWS DRIVE
ASHPALT
CONC. SWK
R.O.W.
10' PUE
1"WM (TYP.)
CONC. SWK
CONC. SWK
GRAVEL
GRAVEL
SSMH [RIM 162.21] IE N EL = 156.08 IE SE EL = 156.12 IE W EL = 155.87
CONC. SWK
R.O.W.
10' PUE
CEDAR CLUSTER @
CEDAR 10" & 12" Drip
LOT 6
LOT 5
LOT 4
LOT 3
LOT 2
LOT 1
PHASE II
COTTONWOOD FIRST ADDITION V. 12, P. 125, B.C.T.P.
LOT 81
6' FENCE
SHADDEN CLAIM SECOND ADDITION V. 12, P. 110, B.C.T.P.
LOT 96A
23RD STREET
PHASE BOUNDARY
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
PHASE I
LOT 7
FF=161.25
LOT 83
6' WOOD FENCE
FIRE HYDRANT
CONNECT TO EXTG G.V.
10' PUE
R.O.W.
8" CL 52 DI WATER
25'
50'
25'
10'
DECD 8" & 12" Drip
DECD 10" & 15" Drip
DECD 12" & 15" Drip
DECD 10" & 12" Drip
DECD 11" & 15" Drip
FENDEL WAY
SSMH [RIM 162.68] IE N EL=156.88 IE E EL=156.76 IE W EL=156.93
SN FENDLE23RD
25'
R.O.W.
10' PUE
1"WM (TYP.)
LOT 18
LOT 17
LOT 16
LOT 15
LOT 14
LOT 13
BAKER CREEK PHASE 2 EAST
SHADDEN CLAIM FIRST ADDITION V. 11, P. 110 B.C.T.P.
DECD 4" & 12" Drip
LOT 72
LOT 73
LOT 75
LOT 76
LOT 77
LOT 78
LOT 79
LOT 62B
LOT 62A
PHASE

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

VERIFY SCALE
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0 1"
IF NOT ONE INCH, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 06/22/2022

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 27, 1978
WILLIAM T. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
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E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

OVERALL WATER PLAN

DRAWING
W-1

JOB NUMBER
2931.0000.0

City of McMinnville
ENGINEERING

M E M O R A N D U M

DATE: March 10, 2022

TO: Heather Richards, Planning Director
Monica Bilodeau, Senior Planner

FROM: Jeff Gooden, Engineering Technician

SUBJECT: **S 1-21**
Elysian Subdivision Phase I & II

Here are our comments and suggested conditions of approval regarding the above listed application:

S 1-21 COMMENTS:

TRANSPORTATION

The proposed subdivision is located adjacent to and NW 23rd St, just east of the Jay Pearson Neighborhood Park. The preliminary plans for S 1-21 indicate that the developer will connect NW NW Meadows Dr between NW 23rd St and NW Snowberry Ct as well as construct a cul-de-sac to complete NW Fendle Way. Additionally the developer is proposing to construct a pedestrian pathway to connect NW Meadows St and NW Fendle Way. There will also be a paved access to the proposed detention pond.

Due to existing conditions on NW Meadows Dr a variance will be granted to the 60' right-of-way (ROW) and street width. NW Meadows Dr will be constructed as a Minor Collector with a width of 36' from curb to curb a 6' planter and a 5' sidewalk 1' from property line, with a 10' public utility easement on both sides of the road.

As proposed NW Fendle Way will be constructed to the Local Residential street standard with a 50' right-of-way, a 28' wide street curb to curb, a 5' planter strip, and 5' sidewalk. The sidewalk shall be curb tight through the bulb of the cul-de-sac with the ROW extending 5' behind the sidewalk to place water utilities behind the sidewalk in the cul-de-sac, with a 10' public utility easement behind the right-of-way on all sides of the street.

Suggested conditions of approval related to transportation include:

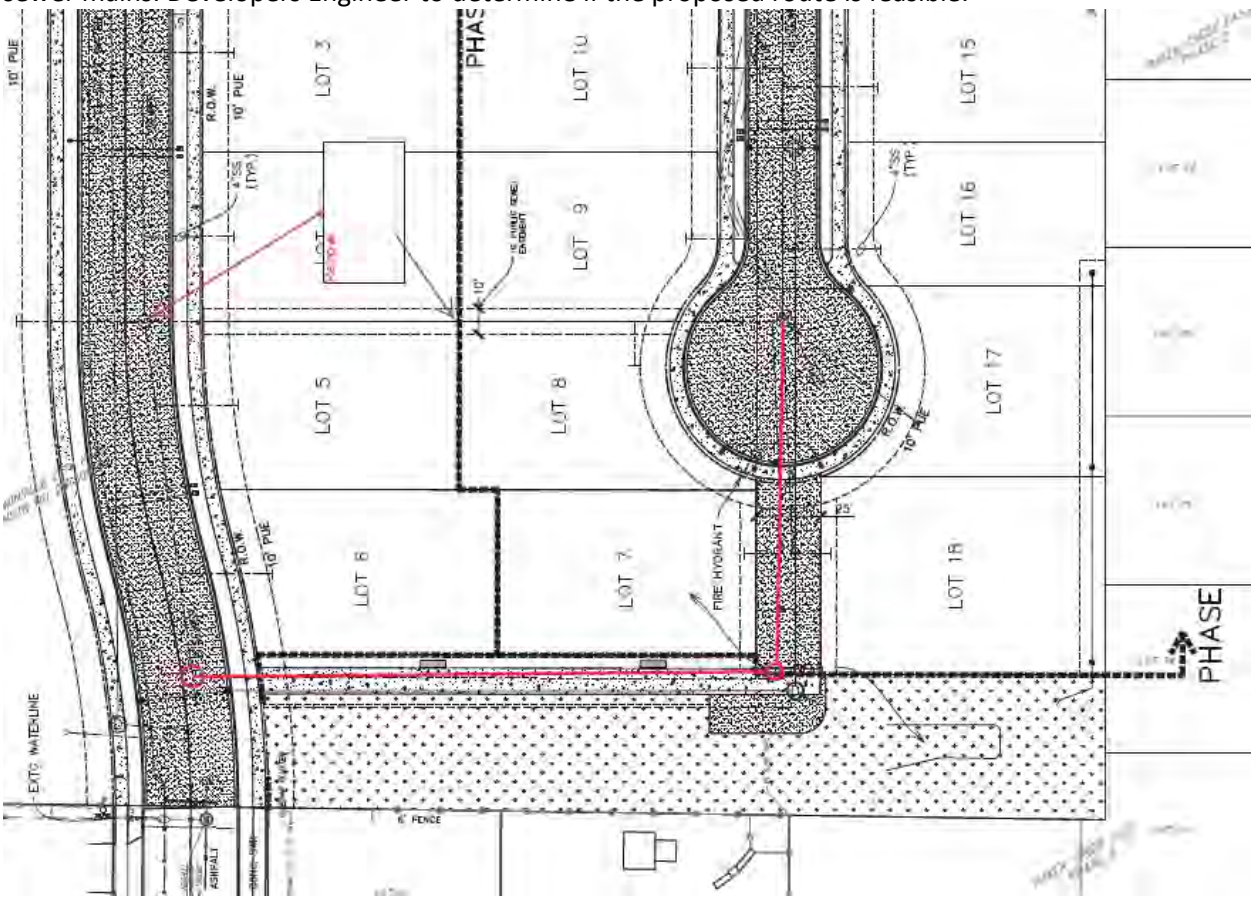
1. The final plat shall reflect that access to the detention pond will be granted to the City for maintenance of the structures.
2. The final plat shall reflect that Tract A will be private.
3. The final plat shall reflect that the pedestrian pathway within tract A will be private. The tract shall have private maintenance agreements which must be approved by the City prior to the City's approval of the final plat.
4. The final plat shall reflect that the sanitary line between Fendle Way and Meadows Dr shall be public
5. The interior streets shall be improved with a 28-foot wide paved section, 5-foot wide curbside planting strips, and five-foot-wide sidewalks placed one foot from the property line within a 50-foot right-of-way, as required by the McMinnville Land Division Ordinance for local residential streets.
6. On-street parking will not be permitted within a 30-foot distance of street intersections measured from the terminus of the curb returns.
7. The City Public Works Department will install, at the applicant's expense, the necessary street signage (including stop signs, no parking signage, and street name signage), curb painting, and striping (including stop bars) associated with the development. The applicant shall reimburse the City for the signage and markings prior to the City's approval of the final plat.
8. The applicant shall submit cross sections for the public street system to be constructed. Cross sections shall depict utility location, street improvement elevation and grade, park strips, sidewalk location, and sidewalk elevation and grade. Said cross sections shall be submitted to the City Engineer for review and approval prior to submittal of the final plat. All such submittals must comply with the requirements of 13A of the Land Division Ordinance and must meet with the approval of the City Engineer.
9. Street grades and profiles shall be designed and constructed to meet the adopted Land Division Ordinance standards and the requirements contained in the Public Right-of-Way Accessibility Guidelines (PROWAG). Additionally, corner curb ramps shall be constructed to meet PROWAG requirements.
10. That the street improvements shall have the City's typical "teepee" section.
11. The applicant shall coordinate the location of clustered mailboxes with the Postmaster, and the location of any clustered mailboxes shall meet the accessibility requirements of PROWAG and the State of Oregon Structural Specialty Code.

SANITARY SEWER

Suggested conditions of approval related to sanitary sewer service include:

1. A detailed, engineered sanitary sewage collection plan, which incorporates the requirements of the City's adopted Conveyance System Master Plan, must be submitted to and approved by the City Engineering Department. Any utility easements needed to comply with the approved sanitary sewage plan must be reflected on the final plat.

2. The City is proposing an alternate route for the sewer main as it prefers to avoid side lot sanitary sewer mains. Developers Engineer to determine if the proposed route is feasible.



STORM DRAINAGE

Suggested conditions of approval related to storm drainage include:

1. That a detailed, engineered storm drainage plan, which satisfies the requirements of the City's Storm Drainage Master Plan, and that demonstrates that the existing downstream storm drainage system has adequate capacity, must be submitted to and approved by the City Engineering Department. Any utility easements needed to comply with the approved plan must be reflected on the final plat.

2. No additional storm drainage runoff shall be conveyed onto any adjacent property without the appropriate public and/or private storm drainage easements. Copies of recorded private easements must be provided to the City prior to the City's approval of the final plat. Any offsite public easements must be dedicated to and accepted by the City prior to the City's approval of the final plat. The HOA will be responsible for the maintenance for the wetland plantings and fencing.

MISCELLANEOUS

Additional suggested conditions of approval include:

1. The final plat shall include 10-foot public utility easements along both sides of all public rights-of-way for the placement and maintenance of required utilities.

2. The final plat shall include use, ownership, and maintenance rights and responsibilities for all easements and tracts.

3. The applicant shall secure from the Oregon Department of Environmental Quality (DEQ) any applicable storm runoff and site development permits prior to construction of the required site improvements. Evidence of such permits shall be submitted to the City Engineer.

4. The applicant shall secure all required state and federal permits, including, if applicable, those related to construction of the storm drain outfalls, the federal Endangered Species Act, Federal Emergency Management Act, and those required by the Oregon Division of State Lands, and U.S. Army Corp of Engineers. Copies of the approved permits shall be submitted to the City.

5. That the applicant submit evidence that all fill placed in the areas where building sites are expected is engineered. Evidence shall meet with the approval of the City Building Division and the City Engineering Department.

6. That the required public improvements shall be installed to the satisfaction of the responsible agency prior to the City's approval of the final plat. Prior to the construction of the required public improvements, the applicant shall enter into a Construction Permit Agreement with the City Engineering Department, and pay the associated fees.

7. That the applicant shall submit a draft copy of the subdivision plat to the City Engineer for review and comment which shall include any necessary cross easements for access to serve all the proposed parcels, and cross easements for utilities which are not contained within the lot they are serving, including those for water, sanitary sewer, storm sewer, electric, natural gas, cable, and telephone. A current title report for the subject property shall be submitted with the draft plat. Two copies of the final subdivision plat mylars shall be submitted to the City Engineer for the appropriate City signatures. The signed plat mylars will be released to the applicant for delivery to McMinnville Water and Light and the County for appropriate signatures and for recording.

8. The City will not maintain the proposed enhanced wetland facility or proposed bioswale along the south boundary of the subject property. The City will maintain the structures (inlets, outfalls, WQ manholes, flow control MH's, etc).

9. All of Tract A, including the proposed wetland and associated pedestrian path should remain private.

10. The access to the storm pond will have a driveway approach with an 8" section of concrete or 6" section with #4 rebar and be PROWAG compliant. The access will be paved to city standards with 10" of 1 ½" – 0 crushed rock under 2" of ¾" – 0 crushed rock and a 3" level 2 WMAC paved section to accommodate maintenance vehicles.

Amanda Winter

From: Amy M. Gonzales <amg@mc-power.com>
Sent: Monday, February 28, 2022 4:42 PM
To: Amanda Winter
Subject: RE: Planned Development, Zone Change & Subdivision (PD 1-21, ZC 1-22 & S 1-21)
Attachments: We sent you safe versions of your files; Exhibit 1 Drainage Plan.pdf; Overall Utility Plan-Power Comments.pdf

Amanda,

Comments from McMinnville Water & Light and attachments for reference.

Water: Developer needs to submit a Subdivision Design Application form to McMinnville Water and Light. The project will require the developer to enter into a Line Extension Agreement (contract) with McMinnville Water and Light (MW&L). The public water system will need to be designed by the Developer's engineer and reviewed/approved by MW&L.

Power: Developer needs to submit a Subdivision Design Application form to McMinnville Water and Light. The project will require the developer to enter into a Line Extension Agreement (contract) with McMinnville Water and Light. The portion of the PUE included in the Drainage Improvements abutting NW Meadows needs to be constructed with an elevation and profile that ensures utilities can be extended through it in a typical manner.

Thank you,

Amy Gonzales
Engineering & Operations Assistant
McMinnville Water & Light
(503) 472-6919 ext 5
amg@mc-power.com

From: Amanda Winter <Amanda.Winter@mcminnvilleoregon.gov>
Sent: Friday, February 25, 2022 3:32 PM
To: Amanda Guile-Hinman <Amanda.Guile@mcminnvilleoregon.gov>; andrew.schurter@nwnatural.com; Anne Pagano <Anne.Pagano@mcminnvilleoregon.gov>; bskinner@msd.k12.or.us; Calo, Peter <Peter_Calo@comcast.com>; Dave Larmouth <dlarmouth@recology.com>; Kopp, Kevin (Tigard) <Kevin_Kopp@comcast.com>; David Renshaw <David.Renshaw@mcminnvilleoregon.gov>; Deborah McDermott <Deborah.McDermott@mcminnvilleoregon.gov>; E&O Engineering Mailbox <Engineering@mc-power.com>; Heather Richards <Heather.Richards@mcminnvilleoregon.gov>; Jeff Towery <Jeff.Towery@mcminnvilleoregon.gov>; jevra.brown@state.or.us; Ken Friday <fridayk@co.yamhill.or.us>; Leland Koester <Leland.Koester@mcminnvilleoregon.gov>; Matt Scales <Matt.Scales@mcminnvilleoregon.gov>; Samuel Justice <SRJ@mc-power.com>; odotr2planmgr@odot.state.or.us; scott.albert@ziply.com; Stuart Ramsing

<Stuart.Ramsing@mcminnvilleoregon.gov>; Susan Muir <Susan.Muir@mcminnvilleoregon.gov>; Jen Hawkins <JenH@mc-power.com>; Amy M. Gonzales <amg@mc-power.com>; Monica Bilodeau <Monica.Bilodeau@mcminnvilleoregon.gov>
Subject: Planned Development, Zone Change & Subdivision (PD 1-21, ZC 1-22 & S 1-21)

Good afternoon all,

The material provided (see description below and attachment) has been referred to you for your information, study, and official comments for the record. Your recommendations and suggestions will be used to guide the McMinnville Planning Director when reviewing this proposal. If you wish to have your comments on the attached material considered by the Commission, please email your response back to our office by **March 11, 2022.** These matters have been tentatively scheduled to be consider by the Planning Commission on **April 7, 2022** at 6:30 p.m., via Zoom.

The following information is the project description regarding PD 1-21, ZC 1-22 & S 1-21:

The applicant is requesting a phased 18 lot Subdivision, Planned Development, and Zone Change located on the 3.79 acre parcel at Meadows Drive and Fendle Way just south of 23rd Street (R4418 00204).

The proposal would include adjusting the side yard setbacks from 7.5 to 5 feet and a Zone Change from (R-1 to R-3), which will allow an average lot size to be reduced from 9000 SF to 6000 SF.

Meadows drive is proposed to be connected along the western side of the subdivision, and Fendle Way will be extended and terminated into a cul-de-sac within the proposed subdivision.

They are also proposing a 16,925 SF open space tract along the southern property line which will contain stormwater facility and adjacent will be a 20 foot wide pedestrian access easement and 10 foot wide paved connection from Fendle to Meadows Drive. Please see attached narrative and Plans.

Your prompt reply will help to facilitate the processing of this application and will insure consideration of your recommendations.

If you have any questions regarding this application, the Planner assigned to this project is Monica Bilodeau, you can reach out to them directly at Monica.Bilodeau@mcminnvilleoregon.gov or (503) 474-4153.

If you are having trouble viewing the attachment, please email me directly or call our office at (503) 434-7311.

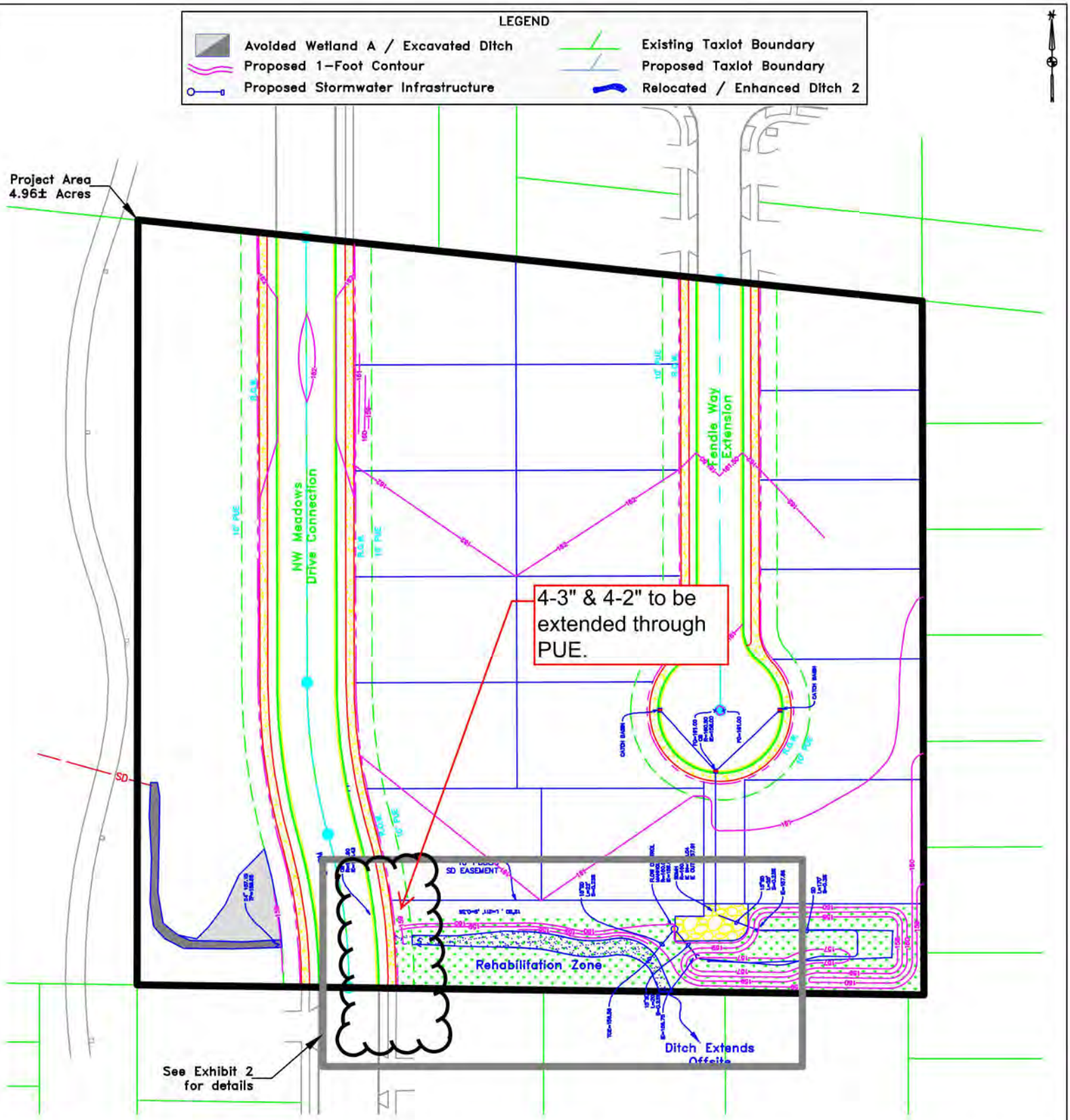
Please note that any written comments/correspondence returned (emails/letters) regarding this request become part of the public record.

Thank you,

City of McMinnville
PLANNING

Amanda Winter
Planning Analyst
(503) 434-7311

231 NE Fifth Street McMinnville, OR 97128
www.mcminnvilleoregon.gov



NOTE: Approximately 180 linear feet (LF) of excavated North Fork Cozine Creek east of the proposed NW Meadows Drive connection would be rehabilitated and placed within dedicated community open spaces along the southern project boundary. Identified stormwater infrastructure facilities and the rehabilitation zone would be constructed during Phase I of subdivision construction (anticipated for summer 2021).

Source: Adapted from Westech Engineering, Inc. civil files.

Terra Science, Inc.
Soil, Water, & Wetland Consultants

GRAPHIC SCALE
0 40 80
(IN FEET)

REVISED DRAINAGE REHABILITATION PLAN
FOR THE ELYSIAN IN-FILL SUBDIVISION PROJECT
(DSL App. 62609-RF & USACE NWP 2020-374)
City of McMinnville, Yamhill County, Oregon

CONCEPTUAL DEVELOPMENT

December 2020

EXHIBIT 1

0 15 30 60
(feet)

CONC. PATH
CONC. PATH
CONC. PATH
CONC. PATH
CONC. PATH
LOT 119
COTTONWOOD SECOND ADDITION V. 13, P. 26 B.C.T.P.
LOT 83
69' B.P.A. EASEMENT V. 405 P. 85
45' B.P.A. EASEMENT V. 405 P. 85
PARKLAND PARCEL 'B'
CONC. SWK
EXTG WATERLINE
EXTG WATERLINE
10' PUE
R.O.W.
8" CL 52 DI WATER
8"SEWER
8"SEWER
NW MEADOWS DRIVE
SSMH [RIM 160.41]
IE N EL = 150.86
IE W EL = 150.86
ASHPALT
CONC. SWK
CONC. SWK
CONC. SWK
CONC. SWK
GRAVEL
GRAVEL
NW MEADOWS DRIVE
SSMH [RIM 162.21]
IE N EL = 156.08
IE SE EL = 156.12
IE W EL = 155.87
R.O.W.
10' PUE
4"SS (TYP.)
1"WM (TYP.)
CEDAR 10" & 12"
Power: Existing 4-3" & 4-2" PVC to be extended north.
Power: Existing 4-3" & 4-2" PVC to be extended south.
LOT 6
LOT 5
LOT 4
LOT 3
LOT 2
LOT 1
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 7
LOT 18
LOT 17
LOT 16
LOT 15
LOT 14
10'
10' PUBLIC SEWER EASEMENT
PHASE BOUNDARY
PHASE I
PHASE
FIRE HYDRANT
CONNECT TO EXTG G.V.
10' PUE
R.O.W.
8" CL 52 DI WATER
8"SEWER
4"SS (TYP.)
1"WM (TYP.)
10' PUE
R.O.W.
25'
FENDEL WAY
SSMH [RIM 162.68]
IE N EL = 156.88
IE E EL = 156.76
IE W EL = 156.93
SN FENDLE23RD
DECD 8" & 12" DrWp
DECD 10" & 15" DrWp
DECD 12"& 15" DrWp
DECD 10" & 12" DrWp
DECD 11" & 15" DrWp
DECD 4" & 12" DrWp
Existing transformer is source of power to Fendle extension.
23RD STREET
SHADDEN CLAIM SECOND ADDITION V. 12 P. 110, B.C.T.P.
SHADDEN CLAIM FIRST ADDITION V. 11, P. 110 B.C.T.P.
BAKER CREEK PHASE 2 EAST
BAKER CREEK PHASE 2 EAST
FF=161.25
6' WOOD FENCE
LOT 963
LOT 964
LOT 955
LOT 948
LOT 944
LOT 628
LOT 62A
LOT 79
LOT 78
LOT 77
LOT 76
LOT 75
LOT 74
LOT 73
LOT 72
1928 BHDR

NO.	DATE	DESCRIPTION	BY
		REVISIONS	
1			

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH, DO THIS SHEET, ADJUST SCALES ACCORDINGLY

DSN. JW
DRN. IH
CKD. JW
DATE: 06/22/2005

REVIEW

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 12, 2005
WILLIAM L. WELLS
RENEWS: 6/30/2022

WESTECH ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
3841 Fairview Industrial Dr. S.E., Suite 100, Salem, OR 97302
Phone: (503) 585-2474 Fax: (503) 585-3986
E-mail: westech@westech-eng.com

VJ-2 DEVELOPMENT
ELYSIAN SUBDIVISION

OVERALL UTILITY PLAN

DRAWING
C4.0

JOB NUMBER
2931.0000.0

Amanda Winter

From: Calo, Peter <Peter_Calo@comcast.com>
Sent: Monday, February 28, 2022 12:02 PM
To: Amanda Winter
Cc: Kopp, Kevin (Tigard)
Subject: RE: Planned Development, Zone Change & Subdivision (PD 1-21, ZC 1-22 & S 1-21)

Amanda,
Comcast dos not have any comments at this time other than.

The Private Developer can contact Comcast for services and cabling when they have their power trenching plan ready. Any moving of Comcast facilities in conjunction with this development will be at the Developers cost.

Pete Calo
Manager 1, Planning & Design
Seattle /Oregon/SW Washington Markets
O (503) 596-3920
C (503) 213-0425

From: Amanda Winter <Amanda.Winter@mcminnvilleoregon.gov>
Sent: Friday, February 25, 2022 3:32 PM
To: Amanda Guile-Hinman <Amanda.Guile@mcminnvilleoregon.gov>; andrew.schurter@nwnatural.com; Anne Pagano <Anne.Pagano@mcminnvilleoregon.gov>; bskinner@msd.k12.or.us; Calo, Peter <Peter_Calo@comcast.com>; Dave Larmouth <dlarmouth@recology.com>; Kopp, Kevin (Tigard) <Kevin_Kopp@cable.comcast.com>; David Renshaw <David.Renshaw@mcminnvilleoregon.gov>; Deborah McDermott <Deborah.McDermott@mcminnvilleoregon.gov>; E&O Engineering Mailbox <engineering@mc-power.com>; Heather Richards <Heather.Richards@mcminnvilleoregon.gov>; Jeff Towery <Jeff.Towery@mcminnvilleoregon.gov>; jevra.brown@state.or.us; Ken Friday <fridayk@co.yamhill.or.us>; Leland Koester <Leland.Koester@mcminnvilleoregon.gov>; Matt Scales <Matt.Scales@mcminnvilleoregon.gov>; SRJ@mc-power.com; odotr2planmgr@odot.state.or.us; scott.albert@ziply.com; Stuart Ramsing <Stuart.Ramsing@mcminnvilleoregon.gov>; Susan Muir <Susan.Muir@mcminnvilleoregon.gov>; JenH@mc-power.com; amg@mc-power.com; Monica Bilodeau <Monica.Bilodeau@mcminnvilleoregon.gov>
Subject: [EXTERNAL] Planned Development, Zone Change & Subdivision (PD 1-21, ZC 1-22 & S 1-21)

Good afternoon all,

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If you are having trouble viewing the attachment, please email me directly or call our office at (503) 434-7311.

Please note that any written comments/correspondence returned (emails/letters) regarding this request become part of the public record.

Thank you,

City of McMinnville
PLANNING

Amanda Winter
Planning Analyst
(503) 434-7311

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EXHIBIT 5 - STAFF REPORT

DATE: **May 19, 2022**
TO: **Planning Commission Members**
FROM: **Tom Schauer, Senior Planner**
SUBJECT: **Public Hearing (Docket CPA 1-20/ZC 1-20) – Cascade Steel Map Amendment, Request for Continuance**

STRATEGIC PRIORITY & GOAL:

GROWTH & DEVELOPMENT CHARACTER
Guide growth & development strategically, responsively & responsibly to enhance our unique character.

OBJECTIVE/S: Strategically plan for short and long-term growth and development that will create enduring value for the community

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Report in Brief:
This agenda item is the Comprehensive Plan Map Amendment and Zone Change (CPA 1-20/ZC 1-20) by applicant Cascade Steel Roiling Mills for the property owned by White Top Properties LLC located at 3225 NE Highway 99 West. The applicant has requested a continuance to the June 16, 2022 Planning Commission meeting.

Background and Discussion:
The application was continued from the April 21, 2022 meeting to the May 19, 2022 meeting. The applicant has requested an additional continuance to the June 16, 2022 Planning Commission meeting. Staff supports this request.

Attachments:
N/A

Recommendation:
Staff recommends that the Planning Commission continue the public hearing to the June 16, 2022 Planning Commission meeting.

"I MOVE THAT THE PLANNING COMMISSION CONTINUE THE PUBLIC HEARING FOR DOCKET CPA 1-20/ZC 1-20 TO THE JUNE 16, 2022 PLANNING COMMISSION MEETING."
