Order of Attachments

Project Area Map 1

Site Plan 2

Pre-Filter Plan 3

Line Item Budget 4

Letters of Support

- **Steve Wise** - Executive Director of the Sandy River Basin Watershed Council 5
- **Michael Guebert** - Board Chair of the East Multnomah Soil and Water Conservation District and Terra Farma owner 6
- **Steve Fedje** - Retired USDA-NRCS District Conservationist 7

Landowner Letter of Agreement 8

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Calculations and Details for System Design 10

Pump Specs 11

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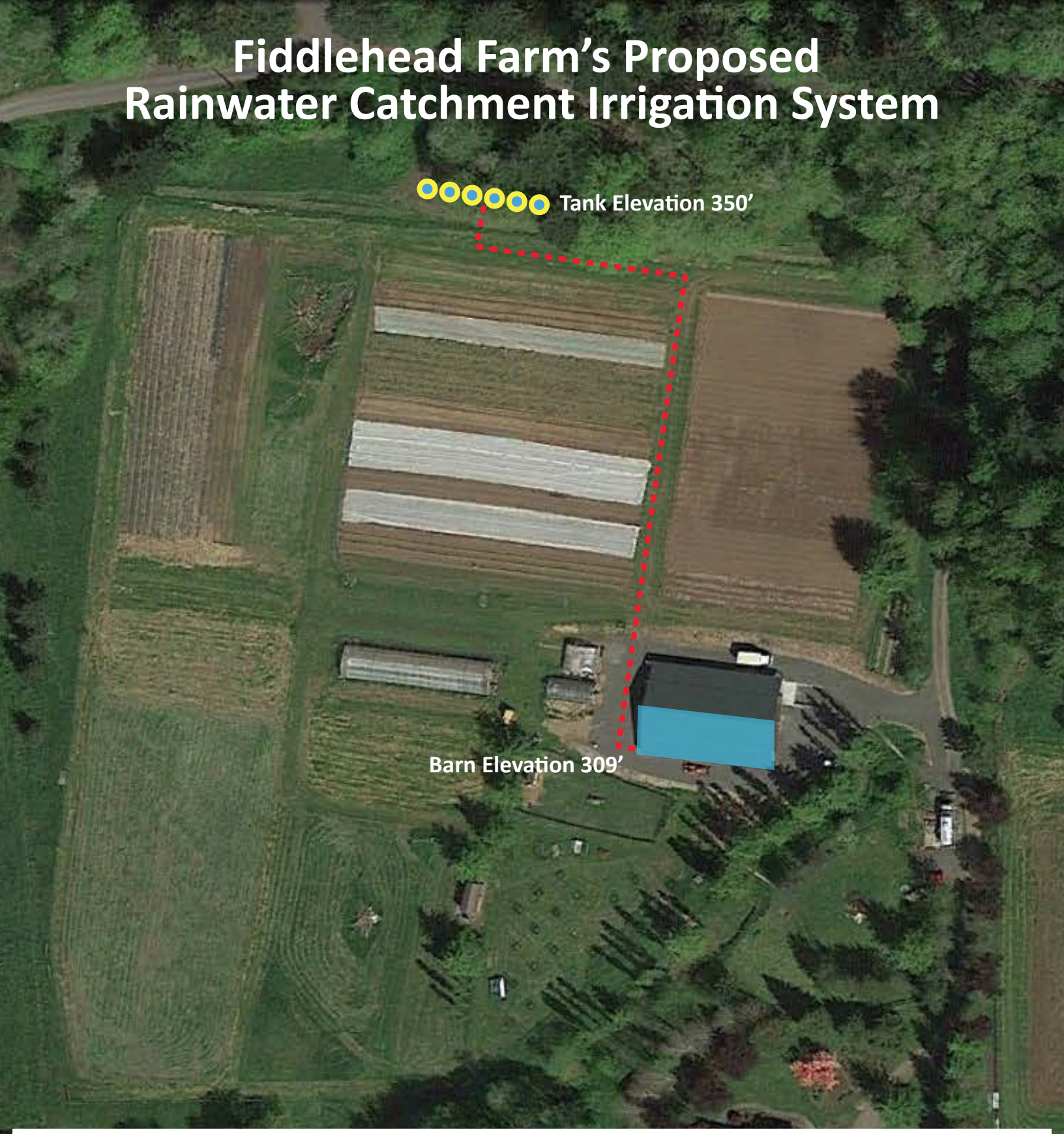
Project Area Map

Fiddlehead Farm's Proposed Rainwater Catchment Irrigation System



1.5-inch PVC Water Line (525ft)

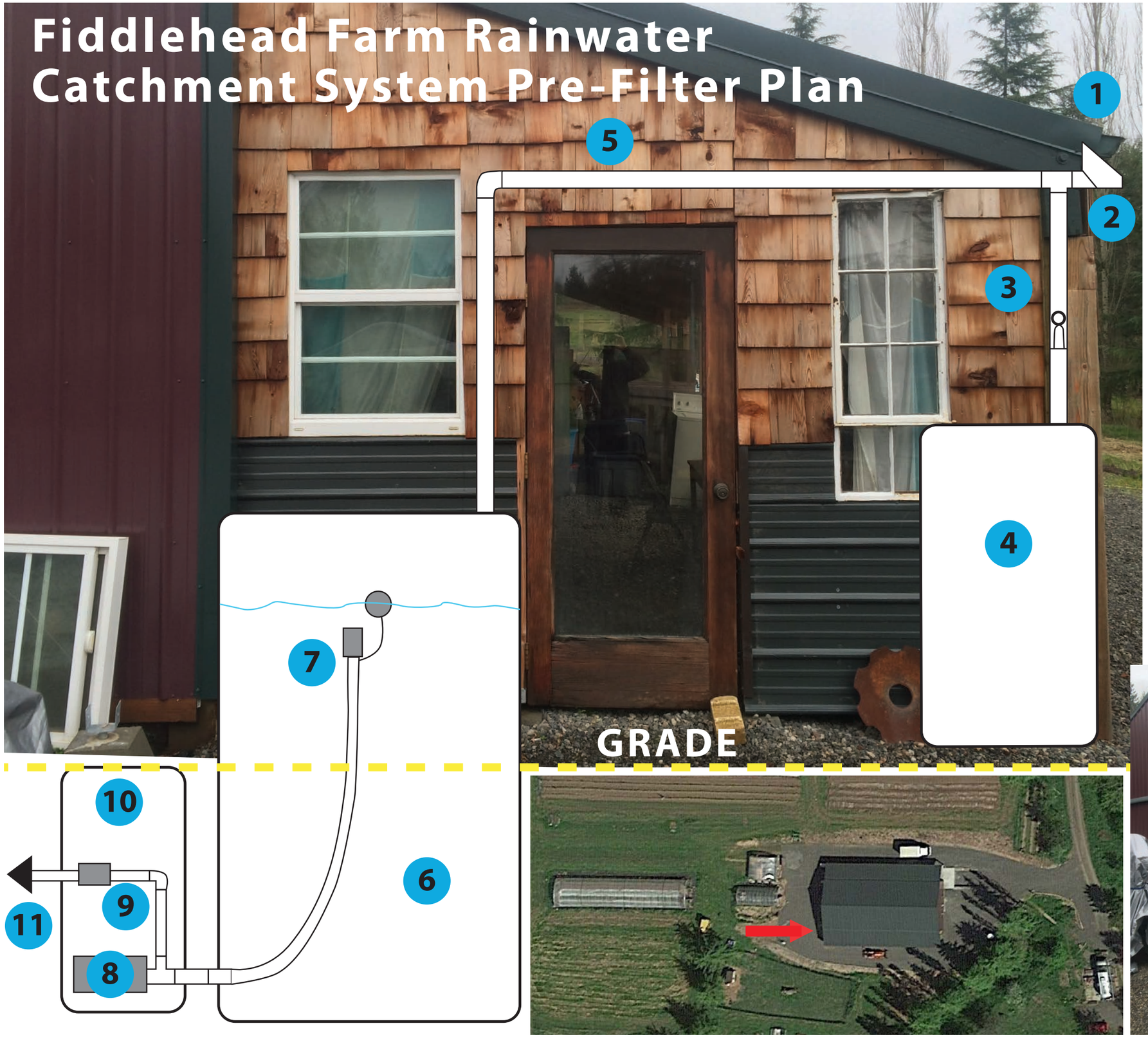
Catchment Area (3024ft^2)

6,600 gallon Above-Ground Water Tank

175ft

FIDDLEHEAD FARM

Fiddlehead Farm Rainwater Catchment System Pre-Filter Plan



FIDDLEHEAD FARM

1 - Gutter (84') for Catchment Area

2 - Leaf Eater Advanced Downspout Filter

3 - 4" First Flush Diverter

4 - Poly-Mart 125g First Flush Tank with Vent Stack

5 - 4" Schedule 40 PVC Pipe and Fittings

6 - Graf Herkules 430g Above / Below Ground Tank

7 - Floating Filter with 2" Coarse Screen and Hose

8 - Price Pump CD150BF on Float Valve Cycle

9 - 1.5" Backflow Preventer

10 - Valve Box for Pump and Backflow Preventer

11 - 1.5" Schedule 40 PVC to Tanks

Fiddlehead Farm Rainwater Catchment Irrigation Project Line Item Budget

Line Items	Units	Cost	In-Kind	Cost Match	OWRD Funds	Total Cost	Source
Materials							
Norwesco 6600 144" x 101" (Part: N-44117)	6	$2,612			$15,672	$15,672	Tank Depot
Graf Herkules 430 Gallon Above / Below Ground Water Tank (GRAF-200200)	1	$789			$789	$789	Tank Depot
Tanks Shipping	1	$6,073			$6,073	$6,073	Tank Depot
Tank Install	100	$20	$2,000			$2,000	Fiddlehead Farm
1.5" PVC Pipe (20')	30	$13			$375	$375	Ferguson
1.5" PVC fittings	8	$3			$24	$24	Ferguson
2" Schedule 80 Bulkheads	12	$58			$696	$696	Flex PVC
Pipe Install	16	$20	$320			$320	Fiddlehead Farm
Trencher Rental	1	$160		$160		$160	Fiddlehead Farm
Prefilter							
Leaf Eater Advanced Downspout Filter	1	$29			$29	$29	Rainharvest.com
First Flush Diverter	1	$29			$29	$29	Rainharvest.com
Poly-Mart 125g First Flush Tank	1	$245			$245	$245	Rainharvest.com
Misc Schedule 40 4" PVC & Fittings	6	$17		$101		$101	Ferguson
Floating Filter with 2" Coarse Screen (1200 micron) and NRV	1	$299			$299	$299	Rainharvest.com
Pump--Price Pump CD150BF-All	1	$1,073			$1,073	$1,073	Mitchell Lewis & Staver Co.
1.5" Backflow Preventer	1	$50		$50		$50	Ferguson
Filter and Pump System Install	80	$20	$1,600			$1,600	Fiddlehead Farm

Site Prep							
Grading	8	$125		$1,000		$1,000	Davis Excavation
Equipment Staging	2	$100		$200		$200	Davis Excavation
Rock	20	$18		$360		$360	Davis Excavation
Rock Hauling	2	$200		$400		$400	Davis Excavation
Outreach							
Video Development and Production	40	$100	$4,000			$4,000	Copoletta Productions
TOTALS			$7,920	$2,271	$25,304	$35,495	
	Fiddlehead Farm Contribution		10190.5				

26000 SE Stark St., Gresham, OR 97030

December 28, 2015

Jon Unger
Water Resources Grant Administrator
Water Resources Department, State of Oregon
725 Summer Street NE, Suite A
Salem, OR 97301

Dear Mr. Unger and Water Supply Development Account Technical Review Team,

I am writing to express the strong support of the Sandy River Basin Watershed Council (SRBWC) for Fiddlehead Farm's proposed rainwater catchment irrigation system, and recommend that you support the project with grant funding. The water harvested through the proposed system would substitute for a substantial portion of the farm's irrigation usage, which otherwise would be withdrawn from Gordon Creek via the Corbett municipal water supply.

SRBWC is an independent, volunteer led non-profit whose mission is to restore and protect the natural, cultural and historic resources of the Sandy River and its tributaries. We work with private landowners and management agencies on a range of activities to restore habitat and engage watershed residents and area volunteers in actions to improve conditions for native fish, wildlife, and the many human uses of the Sandy River basin.

Gordon Creek is one of the Sandy's lowermost tributaries, and has been a target of restoration efforts to support recovery of the Sandy's ESA threatened population of wild salmon and steelhead. Flows in Gordon Creek are essential to habitat quality for salmonids and other aquatic life, so reduction of withdrawals would be a contribution to habitat quality. Especially during summer months when the lower Sandy faces temperature challenges (the lower river is on the 303d list for tempeature), actions such as those proposed in Fiddlehead Farms' rainwater catchment proposal help to ensure cold water flows from Gordon Creek into the lower Sandy. Expanding the use of water harvesting as a substitute source for municipal supply irrigation from can serve as a demonstration for other agricultural producers in the Gordon Creek sub-basin, as well as the Sandy more generally.

The Sandy River Basin Watershed Council is confident that this project will be successful, and that it can serve as a valuable model for other farms seeking to promote watershed health. We will work with Fiddlehead Farm to promote awareness of the project and its benefits on the Council's web site, in social media, and other potential outreach vehicles.

Thank you for considering support for this project,

Steve Wise

Steve Wise, Executive Director

Jon Unger
Water Resources Grant Administrator
Water Resources Department, State of Oregon
725 Summer Street NE, Suite A
Salem, OR 97301

December 18, 2015

Dear Mr. Unger,

Fiddlehead Farm's proposed rainwater catchment irrigation system is an exciting and innovative project with the potential to provide economic viability and resiliency to the farm, and to demonstrate a model for other small farmers to mimic.

I have known both Rowan and Katie for a number of years and have watched their farm grow from a small patch of garlic on rented land to a successful, diversified vegetable farm on their own family-owned land. I have high confidence in their chances for success with this project, as I've witnessed them successfully complete other lofty projects like a major barn construction, working with difficult drainage issues, and construction of energy efficient walk-in coolers. Every project I've seen them accomplish has been done with sustainability and conservation of resources in mind.

As a farmer myself, I would watch this project with keen interest as it could serve as a model not only for other local farms, but region-wide as well. Purchased water can be a huge economic liability for many farmers in our region since our rainfall and growing seasons do not overlap, and if the summer of 2015 is any indication of what future climates may look like, the economic burden will only increase.

Additionally, I serve as the Board Chair for the East Multnomah Soil and Water Conservation District, and promotion of smart water usage is one of our priorities. This project has the potential to slow water runoff, increase infiltration, reduce erosion, and will keep nearly 40,000 gallon of water in the already stressed municipal system available for other uses.

The rainwater catchment irrigation system that Fiddlehead Farm seeks to develop will be impactful and powerful. Rowan and Katie are constantly pursuing ways to improve their farm business with innovative strategies that generate economic opportunities and promote their natural resource health values. While this project will certainly have a resounding impact on watershed health, its true importance is as a model for other farmers throughout Oregon. I can't stress my excitement for this project enough. Please fund Fiddlehead Farm's request.

Sincerely,

Michael Guebert
Chair, Board of Directors, East Multnomah SWCD

Jon Unger
Water Resources Grant Administrator
Water Resources Department, State of Oregon
725 Summer Street NE, Suite A
Salem, OR 97301

1/4/16

Dear Mr. Unger,

I'm writing in support of Fiddlehead Farm's proposed rainwater catchment system. It's a creative and effective strategy for improving conservation efforts and increasing the farm's resiliency. I strongly encourage you to fund their grant.

As a retired United States Department of Agriculture, Natural Resource Conservation Service (NRCS) District Conservationist I spent a good amount of time working with farmers. In my experience it's rare to find farmers so engaged in conservation that have the capacity to assess and address a wide range of natural resource management needs.

Fiddlehead Farm has worked with NRCS since 2011 as part of the Environmental Quality Incentive Program (EQIP). During this time they have embarked on a wide range of cost shares including hoop house construction, invasive removal, exclusion fencing, heavy use area, cover cropping, and more. In each contract they have followed through with their commitments and greatly improved conditions around their farm, both in terms of their operation's viability and the health of their soil and water resources.

Fiddlehead Farm serves as a model farm and thus has been a regular stop for nation-wide NRCS training tours in Multnomah County. These are opportunities for new NRCS employees to get a sense of the range of farms using EQIP and other NRCS services. Both Katie and Rowan's knowledge in conservation and their ability to explain the rationale and approaches to natural resource management have made this an extremely valuable learning experience for NRCS employees.

Katie and Rowan are accomplished at working with government entities on big projects. I have no doubt that if funded they will construct an outstanding rainwater catchment irrigation system that meets the farm's needs while having extremely positive conservation outcomes. As leaders in the small farm community, they will be excellent ambassadors to Water Resources and work to encourage others to undertake similar projects. I strongly encourage you to support this project.

Sincerely,

Steve

Steve Fedje
Retired District Conservationist USDA-NRCS
19132 S Coquina Ct
Oregon City 97045
503.701.2497
macneither@me.com

To: Mr. Jon Unger
From: Joseph Coppoletta
Re: Water Resources Development Account Grant for Fiddlehead Farm
Date: 1/3/16

Dear Mr. Unger,

As the landowner at 33200 SE Stevens Rd., Corbett, OR 97019—a property also known as Fiddlehead Farm—I am writing to inform you that I have read the Water Resources Development Account grant application and give my full consent to the proposed project.

Katie and Rowan are just a few years into their 99-year lease of the farmland on this property. Adding a rainwater catchment irrigation system would be an incredible asset to their farm and this property and would help ensure the continued farming of this land for generations.

I strongly encourage you to support this project.

Sincerely,

Joe Coppoletta
Landowner
33200 SE Stevens, Rd.
Corbett, OR 97019
503.200.2931

Katie Coppoletta
<katie@fiddleheadfarmers.com>

Water Supply Development Grant

Quigley Karen M <karen.m.quigley@state.or.us>
Wed, Dec 30, 2015 at 11:00 AM
To: Katie Coppoletta <katie@fiddleheadfarmers.com>

Hello Katie,

Three Tribes have interests in the area: Confederated Tribes of Grand Ronde, Confederated Tribes of Warm Springs and Confederated Tribes of Siletz. If your project is on the Columbia River (and could possibly affect fish) there could be additional Tribes.

Regards,

Karen

Karen Quigley, Executive Director

karen.m.quigley@state.or.us

Legislative Commission on Indian Services

Calculations and Details for System Design

Rainwater Catchment Calculations

Catchment Area: 36' x 84' = 3024ft^2

Corbett Rainfall = ~80" according to intellicast.com (although we usually measure around 60" - 70"/year)

Harvested Water (gallons) = Catchment Area (ft^2) x Rainfall (inches) x 0.623 Conversion Factor

Using just 45" of rainfall (the statistical average from November through February)

84,777g Harvest Potential (at 45" of rainfall) = 3024ft^2 x 45" x 0.623

Subtract out 125g for each rain event as the first flush diverter and it still leaves roughly twice the rainfall needed to fill the 39,600g system.

Pump Calculations

Target flow rate of 30gpm

Rise = 50' Run = 575' Pipe size = 1.5" PVC Bends = 5 (90º)

Chosen pump is Price Pump CD150 iron with bronze impeller (2" suction / 1.5" discharge, Motor P/N 1254: 2 HP 3600 RPM 1 Ph 60 Hz TEFC 56C 115/230v 23/11.5 FLA 1.15 F FTLS) -- SEE ATTACHED PUMP CURVE and DETAIL SHEET

Centrifugal Pumps

CD150SS
Shown

CD100/150

Pump Volute / Impeller Materials

CD (AI) – Cast Iron / Cast Iron
CD (BF) – Cast Iron / Bronze
CD (SF) – Cast Iron / 316SS
CD (AB) – Bronze / Bronze
CD (SS) – 316SS / 316SS
CD (HC) – Hastelloy C / Hastelloy C

Features

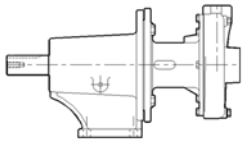
- **Pump Design** – Compact, close coupled
- **Double Seal** – Type 21 available
- **Teflon Seal** – Type 9 available
- **Flush Options** – Recirculating, Internal, & Quench available

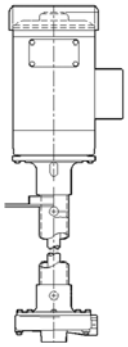
Applications

- Vapor Degreaser
- Chillers
- Deionized Water Processing
- Filter Systems
- Water Treatment Systems
- Circulation / Filtration

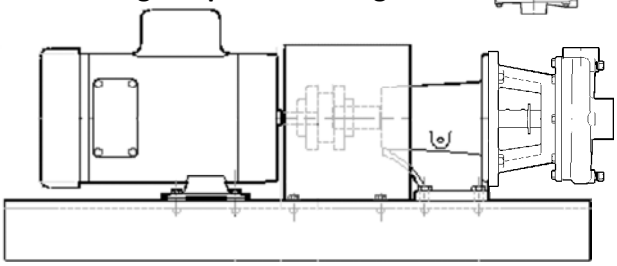
Optional Configurations

- **Air Motor:** Up to 2-1/2 HP
- **Vertical Mounting:**
- **Power Frame Mounting:**





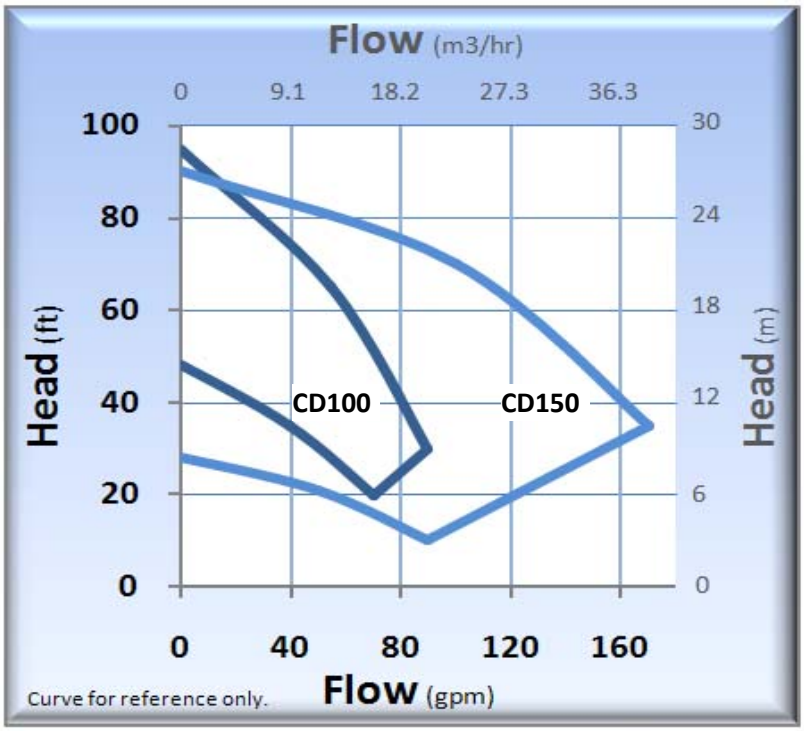
- **Long-Coupled Mounting:**



Standard Specifications

- CD100 / CD100V Discharge 1” FNPT, Suction 1-1/4” FNPT
- CD150 / CD150V Discharge 1-1/2” FNPT, Suction 2” FNPT
- Maximum Impeller Diameter: 4.94”
- Stub Shaft: 5/8” 316SS (7/8” Optional)
- Motor: NEMA C Face (Multiple enclosures available)
- Mechanical Seal:
  Single, 5/8” Type 6A Buna, Carbon vs. Ceramic (AI, BF, SF, AB)
  Single, 5/8” Type 21 Viton, Carbon vs. Ceramic (SS)
  Single, 5/8” Type 9 Teflon, Carbon vs. Ceramic (HC)
  Note: Additional seal options available

Performance Curve – 60 Hz



Rev. Date: September 2010

Pump Data Sheet - Price Pump Company

Company:

Name:

Date: 12/7/2015

Pump:

Model: CD100 Al/AB

Type: CD100/CD150
Synch speed: 3600 rpm

Speed: 3500 rpm
Dia: 4.25 in

Curve: CD001-1

Impeller:

Specific Speeds:

Ns: ---
Nss: ---

Dimensions:

Suction: 1.25 in
Discharge: 1 in

Search Criteria:

Flow: 20 US gpm

Head: 65 ft

Near miss: 10 % of Head

Fluid:

Water
SG: 1
Viscosity: 1.105 cP

Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

NPSHa: ---

Pump Limits:

Temperature: 250 °F
Pressure: 75 psi g
Sphere size: 0.15 in

Power: ---
Eye area: ---

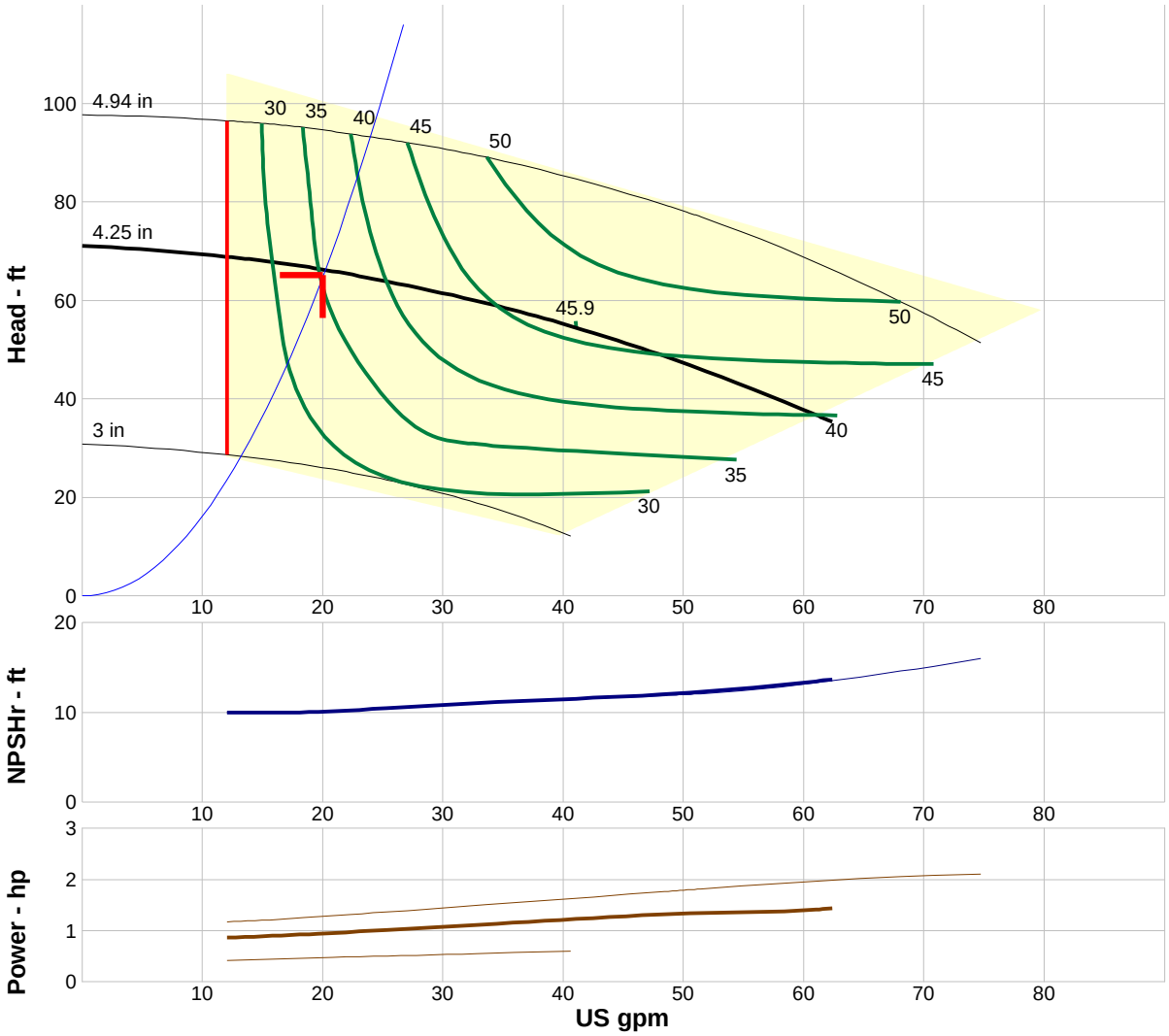
Motor:

Standard: NEMA
Enclosure: Std

Size: 1 hp
Speed: 3600
Frame: --

Sizing criteria: Design Point

---- Data Point ----	
Flow:	20 US gpm
Head:	66.3 ft
Eff:	35.3%
Power:	0.946 hp
NPSHr:	10.1 ft
---- Design Curve ----	
Shutoff head:	71.2 ft
Shutoff dP:	30.8 psi
Min flow:	12 US gpm
BEP:	45.9% @ 41 US gpm
NOL power:	1.44 hp @ 62.4 US gpm
-- Max Curve --	
Max power:	2.11 hp @ 74.7 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
24	3500	64.5	38.9	1	10.4
20	3500	66.3	35.3	0.946	10.1
16	3500	67.8	30.3	0.903	9.99
12	3500	68.9	24.2	0.863	10
8	3500	---	---	---	---

Selected from catalog: price close coupled pumps.60 Vers: 1.8

CD100/150

Technical Information		
Max Flow (CD100) **Max Flow** (CD150)		**90 GPM** (20.4 m3/hr) **170 GPM** (38.6 m3/hr)
Max Head		**95 feet** (29 m)
Min. Flow (CD100) **Min. Flow** (CD150)		**12 GPM** (2.7 m3/hr) **25 GPM** (5.7 m3/hr)
Max Solid Size		**0.150"** (3.81 mm)
Max Working Pressure	(Type 6A Seal) (Type 8 Seal) (Type 9 Seal) (Type 21 Seal) (Type 2106 Seal)	**75 PSI** (5.2 bar) **325 PSI** (22.4 bar) **350 PSI** (24.1 bar) **150 PSI** (10.3 bar) **150 PSI** (10.3 bar)
Max Temp.		**300°F** (121°C)*

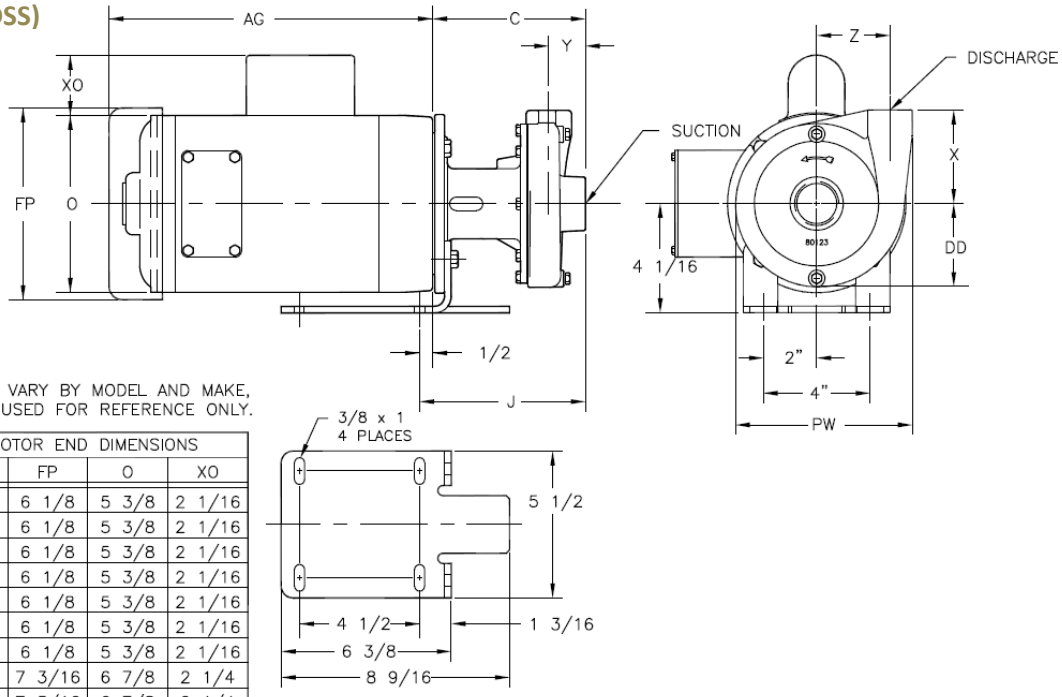
* *Temperature limits will vary according to the liquid being pumped and the sealing materials used.*

Materials of Construction						
CD	**AI**	**BF**	**SF**	**AB**	**SS**	**HC**
Volute	Cast Iron	Cast Iron	Cast Iron	Bronze	316SS	HC
Impeller	Cast Iron	Bronze	316SS	Bronze	316SS	HC
Bracket	Cast Iron	Cast Iron	Cast Iron	Bronze	316SS	HC
Gasket**	Syn. Fiber	Syn. Fiber	Syn. Fiber	N/A	Teflon	Teflon
O-ring***	Buna	Buna	Buna	Buna	Viton	N/A
Fasteners	Plated Steel	Plated Steel	Plated Steel	18-8 SS	316 SS	HC

** *Volute gasket is standard on CD100AI, BF, SF, SS, & CD100/150 HC.*

*** *Volute O-ring is standard on CD100AB, and CD150AI, BF, SF, AB, & SS.*

Dimensions (CDSS)



NOTE:
MOTOR DIMENSIONS WILL VARY BY MODEL AND MAKE, DIMENSIONS ARE TO BE USED FOR REFERENCE ONLY.

	MOTOR END DIMENSIONS			
HP RPM FRM	AG	FP	O	XO
1/4 1800 56C	7 3/4	6 1/8	5 3/8	2 1/16
1/3 1800 56C	8 1/4	6 1/8	5 3/8	2 1/16
1/2 1800 56C	8 3/4	6 1/8	5 3/8	2 1/16
1/3 3600 56C	8 1/2	6 1/8	5 3/8	2 1/16
1/2 3600 56C	8 3/4	6 1/8	5 3/8	2 1/16
3/4 3600 56C	9 1/4	6 1/8	5 3/8	2 1/16
1 3600 56C	9 3/4	6 1/8	5 3/8	2 1/16
1 1/2 3600 56C	10 1/2	7 3/16	6 7/8	2 1/4
2 3600 56C	11 1/8	7 3/16	6 7/8	2 1/4
3 3600 56C	12 3/8	7 3/16	6 7/8	2 1/4
5 3600 184C	13 5/8	8 1/2	7 7/8	2 1/4

NOTE:
ALL DIMENSIONS HAVE BEEN ROUNDED TO THE NEAREST 1/8".

	PUMP END DIMENSIONS								
	C	DD	PW	X	Y	Z	J	SUCTION	DISCHG
CD100 SS	5 3/4	3 1/8	6 5/8	3 1/2	1 3/8	2 3/4	6 1/4	1 1/4	1"
CD150 SS	6 13/16	4 1/16	7 15/16	3 13/16	2 1/8	3 1/16	7 5/16	2"	1 1/2

PRICE PUMP CO.

21775 Eighth Street East
Sonoma, CA 95476-0329
MAIN (707) 938-8441
TOLL FREE (800) 345-7867
FAX (707) 938-0764
E-mail: sales@pricepump.com
Website: www.pricepump.com

Contact factory for special pump configurations, same day, and next day delivery options.

Member of: Hydraulic Institute

Rev. Date: September 2010