PARADISE IRRIGATION DISTRICT

TO: **Board of Directors**

FROM: **Kevin Phillips**

DATE: **4/13/2018**

RE: **Chico State Project**
04/18/2018 Board of Directors Meeting

Phil Kelly (former PID District Manager) contacted Chico State Professor Jackson Webster, Ph.D. about the possibility of studying the effects of rooftop watering during a wildfire. Dr. Jackson thought this would be a great project for Chico State to study. The project would be collaboration between PID and Chico State.

Attached is an email from Dr. Jackson, which explains the project in further detail.

Kevin Phillips

From: Jackson P Webster <jwebster13@csuchico.edu>
Sent: Thursday, April 12, 2018 5:52 PM
To: Kevin Phillips
Subject: RE: Paradise Irrigation District

Hello Kevin,

Yes, I spoke with Phil last week and I am definitely interested in the project. Just to give you a little background, my main area of research is wildfire and water quality. I have spent a fair amount of time thinking about wildfire and wildfire threats to infrastructure, though not exactly from this angle. Broadly speaking, I am half environmental and half water with a background in fire, so probably your guy for the job. I definitely see a need for increased community preparedness across the western US and innovative systems like this could be one approach to protecting communities. I am excited to think about this issue!

I have a couple initial thoughts regarding the proposed project:

1. The biggest question for developing a system like this is water availability. We will need to carefully consider fire flow requirements and water storage – if the system draws too much water (i.e. residents all turn on a sprinkler system at once) it could cause a loss of pressure at fire hydrants. Until we know what the water availability and usage restrictions are, we can't really design a system or even figure out the sprinkler set-up on the buildings.
2. Other mitigation strategies, such as vegetation reductions, yard maintenance, building material choice, etc. should be considered in concert with the sprinkler system – I fear that a ripping wildfire on a hot and windy day may not be stopped by a sprinkler system alone. If we move forward with the concept it should probably be with the thinking that this is a "last ditch measure" in the event of such a wildfire. Not a 100% guaranteed suppression measure. I look at what happened in Santa Rosa last year and I just don't think there is anything that could have stopped that inferno. The bottom line is that we will need to make sure that expectations are realistic.

I think my approach to the project would be to do some back of the envelope calcs and see if the existing system can handle the increased demand. If the numbers seem reasonable I think we could do some mapping and modeling of the distribution system using Autocad and Watercad. I don't know if you already have this kind of mapping, some communities do, some don't. If not, this could be a potentially useful deliverable regardless of the project outcome. Once we have the flow and pressure data, we can model the effects of the increase demand to determine how much water and how long we can supply each house. Simultaneously, we can think about how much water and how to best apply water to structures. If the two meet in the middle, we may have a good concept. At that point I would submit a report and give you our preliminary designs for you to decide how to involve consulting or city/county engineers to implement.

I think the project would be great for a civil engineering student or a small team of students and there are a couple ways we could move forward. One way is to use this project as a topic for a class. I can schedule an advanced water resources class for the fall 2018. This option has the benefit of free labor! Alternatively, I can hire a civil engineering student to intern for the summer to work on the project. This would require some financial support. I suppose there are other options too, such as PID or Paradise hiring an intern for the summer that would work with me. Again, it is possible that we produce a watercad model, or other deliverable, that benefits the PID either way we go on the project.

Sorry for the long email!

Looking forward to hearing your thoughts.

Jack

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From: Kevin Phillips [mailto:kphillips@paradiseirrigation.com]
Sent: Wednesday, April 11, 2018 1:50 PM
To: Jackson P Webster <jwebster13@csuchico.edu>
Subject: Paradise Irrigation District

Mr Webster,

I received your name from Phil Kelly. He said that you may be interested in doing a research project on the benefits of sprinklers on rooftops during a wildfire. We have included this item on the Board agenda for April 18th at 6:30. If you have information that you would like to provide with this item please feel free to send that information directly to me.

Thanks

Kevin Phillips