

Flooding at The Spruces during Tropical Storm Irene, August 28, 2011

Presentation by Tim Kaiser, Director of Public Works

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Transcription by Catherine Yamamoto, Chair, Williamstown Affordable Housing Committee,
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First, I think it would probably be useful to just acquaint everyone with the situation that exists down there. As previous studies go, this is a plan that was prepared for Morgan Management by Guntlow and Associates in 2004. It is a flood inundation plan of their property, the entire property of The Spruces. This is based on the 1984 USGS-prepared flood insurance map that the federal government issues. So that is the source of the data. What this map shows, in the base flood, or the 100-year flood, everything that is in color is area in the flood plain that would be underwater and the different colors represent the depth of the water that would likely occur. The yellow, for example, is 4-6' deep everywhere in here [area where homes were], we've got some slightly shallower areas, 2-4' here [east end], down here at this end of the park [west end] it's 10-12' deep. That is what is expected to occur in a 100-year storm.

The black lines [along north bank and mid-way east to west through the area where the homes were], which I added because they weren't in this data set, so I transferred them from another plan, is the calculated, regulatory flood way. And in simple terms, in this storm event, between the black lines is the flowing river. That's where all the force comes through. Over here [along the southern, Rt. 2 side of the park] might be backwater, but here [between black lines] is where the river is really moving through. That gives you some idea of the level of the problem there. It's stated in the flood analysis that this is a high hazard area; it's not really a good place for housing.

Now over the years, a number of ideas have been floated about, as a matter of fact we applied for a Hazard Mitigation Grant back in 2006 that would take some of the overflow water that comes off the Luce Road area and try redirecting it around the park to minimize the nuisance flooding that occurs there. That was rejected as doing not enough good and too expensive, if really, it wouldn't have made a big difference for anyone. The real issue is the river and the potential for flooding. I know that recently people have been suggesting that perhaps a flood chute should be built. Well, my experience is that regulations have changed so much since the chutes were built in North Adams and Adams, that it is effectively impossible to permit such an undertaking. Ironically it was the Army Corps of Engineers that designed and built the flood chutes in North Adams in the 1950s thinking it was a good thing to do, and well on some fronts it was, because it probably saved the city during Irene, but under today's regulations it really can't be done. You're talking about the wholesale destruction of the entire riverbed for an undetermined length. It's not permit-able under today's regulations.

If you were to accept it as a miracle and assume that you could get it permitted, it would be expensive beyond anyone's ability to pay for it. I was speaking with an engineer this afternoon, just trying to kick around some numbers as to what it would take. We came up with something

on the order of \$20 million in concrete alone. That's not including excavation. Anytime you deal with people with the money to fund a project like that, you need to be able to demonstrate to them that the benefit outweighs the cost. In this case it would be the remaining mobile homes in the park, which I'm sure are very valuable to their owners, but don't compare to tens of millions of dollars in construction costs. So I really don't think that there's anything that can be done at this location that can make it safe. That's been my take, and I've looked at this issue for quite some time.

Question by Yamamoto: Now there's a berm along the river. Can you tell us when that was put in?

That was something the original park developer put in. I believe he experienced some flooding soon after the park was built and back when you could still do it, he made a berm, which was an attempt to keep the ten-year flood out. And it's relatively effective for small storms. When the water stays on the back side, on the river side of the berm, the flooding is only minor and usually from the street drainage from the Luce Road area. It basically, the river level comes up so that it covers the outlet pipe from that drainage system and actually backs into it so water is pooled inside the park until the river level drops enough for it to go out. It's inconvenient.

Question by Ellet [member of Affordable Housing Committee]: Tim, we keep hearing about the drainage off the Luce Road area. Has that increased a lot from what you can tell in the last 10 or 15 years?

Well, when we re-did the drainage, when we did the street construction on that road, I'm trying to remember when that was – 2002, 2003 – somewhere along that time frame -- we were very careful to make sure that the peak run-off did not exceed the conditions that existed before we started the work. So, the pipes were sized differently, the outlets were sized differently, the net cross-sectional area of the outlets from that area are less than what they were before, so at least from that work, no. Over time, sure, development occurred on that hillside and there's more impervious area up there now than there was. Another thing that greatly impacted the ability of the downstream drainage area to handle that flow, was the fact that the park owner, when he originally built it, filled in an open stream and piped the water through the park and the pipe that he put in was too small. And it's still there. It's a bit of a bottleneck.

Question by Yamamoto: Can you talk, Tim, about the two streams that are often mentioned, one to the west and one to the east of the park?

Well the one that I'm most familiar with, the one to the east, is Paull Brook and that also comes off beside Luce Road, down the hill by the airport. What I've observed, and this is actually when flooding conditions occur, I'm usually standing on the berm right there [at outlet of Paull Brook into river] that's a good vantage point to see what's happening. I've seen the river rise to the point where it's basically backfilling this channel, all the way up to Rt. 2. It's nearly flat and water seeks its own level and as the river comes up it will back that channel right up. This is also the point [same location on berm] at which the water started coming over the berm during Irene. And it came over very rapidly.

Question by Yamamoto: So it might appear that it's coming from the brook, but it's really coming from the backup of the river.

It's really a combination of both. The hillside flushing out, it can't get into the river because the river's trying to go up the upstream so it goes anywhere that it can, including over the berm when it gets high enough.

Question by Short [member of Affordable Housing Committee]: Tim, can you draw or sketch on there [on the map] where in Irene was the extent of the flooding that occurred?

The extent of flooding was pretty much what you see in the colored area [various flood inundation levels indicated by color] it just wasn't this total depth. We had water, the river was actually up against the sidewalk on Rt. 2. It didn't quite come over as is shown here, and the total depth was less than this total. We use the USGS gauge station just upstream in North Adams as our common point of measure for what's going on here in the river. Normally, under normal conditions, this river is about 5-1/2' deep at the gauge and flows at about 100 cu. ft. per second, that's about 45,000 gallons a minute. Under Irene, the peak flow was 12,900 cu. ft., per second and the river was 13.75' at the gauge. Irene was not a 100-year storm; it was something significantly less than that. The storm that happened in 1938 that caused a lot of damage around town, would have looked a lot like this map, maybe not quite this bad. That was 16,000 cu. ft. per second. That's the kind of range of flow that can come down this river. So Irene at 12,000 did this kind of damage. That some report that this data came from [flood inundation map] said that the 100-year storm could be as much as 30,000 cu. ft., so way more damaging than what occurred in Irene.

Question by Yamamoto: Could you just orient us, point out where Main Street is and where it would go?

This is Main Street here, the Hoosac River, and Paull Brook coming down by the old Country Peddler building over here. The shopping center is off the map, out in this area. The lions [entrance to mobile home park] right there.

Question by Yamamoto: And the coloring, again the yellow is what height?

Yellow is 4-6' flood inundation [largely the central portion where the homes were].

Question by Yamamoto: And the highest flood inundation is what color?

That would be this over here which is 10-12' [west end of property].

Question by Yamamoto: The rust and brown are the worst?

No, this [pointing to eastern end of park], is actually lower, 0-2', this is 2-4', this is 4-6', and that one is 6-8' of water depth in that storm event [100-year flood] in that location.

Question by Yamamoto: Can you please tell us a little bit more about these outlet pipes that are in the river bank and how they function?

Well, there is a drain that comes down Luce Road area, picks up part of Rt. 2, drains everything in the park and exits out through the berm and into the riverbank.

Question by Yamamoto: So it's perforated pipe or something under the ground?

It's about a 3 foot in diameter reinforced concrete pipe.

Question by Yamamoto: And how does the water get into that pipe?

From storm drains in the park and in the street

Question by Yamamoto: And they empty into the river from the riverbank?

It's underground, low enough to pick up all of that drainage, and it exits through the berm, about halfway from the top of the berm to the normal water level of the river.

Question by Yamamoto: So if you were standing on the other side of the river looking towards the Spruces, you would see water flowing out of these pipes into the river.

Yes, there's an outfall pipe, there's one there that I'm aware of, there's an outfall pipe through that berm into the river. Now under normal conditions, it does just that, you see an outfall. When you get flooded conditions, the river level comes up over that pipe and the water starts backing into the pipe.

Question by Yamamoto: And that would cause the water to start coming up out of the storm drains.

Question by Yamamoto: Normally, how high above the river are those? If the river is not in flood stage, how high above the river are those pipes [in the river bank].

Many feet. And it drops down a considerable distance.

Question by Yamamoto: And the creek to the west of the park?

Well, the next real water body, well, there's a small drainage that runs down through here [pointing to southwesterly border of the property], but just off the map about here is the Green River, the confluence of the Green and Hoosac Rivers is probably right about here if it were to be shown on the map [pointing to a point to the west-northwest of the property] and the flood area for that backs up this way towards Main Street.

Question by Yamamoto: I've heard mention that there is something to the west of the park, really not until you get to the Green River, which is at the bridge?

Really nothing the size of either of the others. There's a small drainage that meanders through this end of the park [west end]. It doesn't have a big drainage area and it normally doesn't convey much water.

Question by Yamamoto: Can you talk about what effect the cement flood chutes in North Adams have downstream?

Well, the general effect of flood chutes is to take a quantity of water and move it in a smaller space faster.

Yamamoto: Funneling it.

Yes, funneling it, with in the defined channel that has been created. That has the possibility of creating downstream erosion, downstream impacts, faster velocities when it goes back to a natural stream. Those flood chutes have been there 50 years, so what we see there now is what we consider normal. I doubt that the river reacted exactly the same way before those flood chutes were there, and that's one of the reasons why you really can't build them anymore, because you really can't cause impacts on your downstream neighbors or your upstream neighbors. If you, just the building of this small berm here [north edge of park along the riverbank], which is effective in keeping small floods out of the park, I'm sure today would not be allowed because it prevents flood waters from getting into the flood plain and it's causing that water either to back up upstream, causing somebody else harm, or increasing its velocity as it goes downstream and causing someone else harm, and under the regulations, you can't cause anyone else harm.

Question by Yamamoto: Let's pretend for a moment that there aren't any regulations or laws and we could build a berm along the river or all around the Spruces. What effect would that have, if we walled it in?

It's still the lowest spot in the area and if you walled it in so that water from the outside couldn't get in, you would still have the water that passes through that can't get out through that pipe we talked about which would accumulate in the park. So flooding would not go away, devastating flooding, unless that berm you built failed, i.e., Katrina, or if the storm that occurred was greater than the storm that you designed the berm for, either of which might happen. So you might be able to make it better, but you couldn't guarantee that it would be safe. You could make it safer.

Yamamoto: So current laws wouldn't allow for that type of mitigation anyway.

I don't believe so.

Question by Lauren Stevens: Lauren Stevens, 50 Walnut Street, Williamstown and with the Hoosic River Watershed Association. As Tim pointed out, during Irene there was a disproportionate amount of water or cubic feet per second in the Hoosic compared to what we saw in the valley, which may puzzle some people. It was about a 50-year storm. We got five inches of rain in the valley, so where did the water come from? It wasn't all that much coming

from the south branch, where it came from was the north branch of the Hoosic because in Vermont, while we were getting about 5" down here, they were getting about 15". Also up in Savoy, up in the highlands and north of us, they were getting a lot more rain. So the water was coming down from the north branch, which only leads to the observation that had we gotten more water in the valley, as communities around us did, both to the northeast in the Deerfield Valley and west in the Hudson Valley, in the Catskills and Schoharie County [NY], we would have had a situation far more intense. We lucked out. We wouldn't really be here today talking about the remaining units in the Spruces, I don't think. So the question that that raises is what's happening? Are things changing? Is it going to get worse at the Spruces? One can't really say whether, in particular, that what happened, that Irene was a result of climate change, but we do know that climate change scientists predict increasing amounts of water and if you look at the precipitation charts for this area, up until about 1970 was a period when we were getting actually below average precipitation a year. Since 1970, the precipitation has been increasing, and if you look at a chart it's about a 30 degree angle, the trend line is going up rather steeply. This is certainly what scientists who are involved in climate change would have predicted, we would get not necessarily more storms, but more rain with storms. And that is a matter I think again of concern in looking at this particular site. We may be just saying what's possible now, we may be saying what's going to be possible in the future? Is it going to get worse? Finally just a comment, that one of the participants in our "State of the River" conference in September, Bill Botzow, who is a Vermont state legislator, pointed out that normally when we ask private property to perform a public service, let's take putting it into conservation or allowing recreational use on it or perhaps we're saying that agricultural use is so significant that it's a public service, we do reimburse the private property owner. There is no provision for doing that in connection with private property which is relieving pressure, just as Tim explained, on the river, which is taking overflow, which is reducing the velocity of the water, the force of the water, we have no way of systematically doing that. So that for example in Irene, the Barnett Farm in Adams, the North Branch Nursery up in Stamford, the Bonnie Lea Farm in Williamstown all had significant damage done, the Williams College playing fields, Williams College spent thousands of dollars trying to clean up those playing fields. Well, here we have an opportunity, as luck would have it, to in fact do that. To say, here is a parcel of land, privately owned, and we have the opportunity, if this funding comes through, to reimburse the property owner, Morgan Management, and at the same time, to reinstate the function of that property as Tim has described it, as a flood plain and the function that would perform and thereby doing the public good and particularly for those private property owners downstream and upstream that are affected by floods in this area. And I think another factor we have to keep in mind is that in a way, the river running through Williamstown is already bermed on its eastern or northern side by the railroad. The railroad had created a berm there and runs its tracks along there. So we've already got half of the river bermed, again, prior to the kind of regulations that Tim was concerned of, so there's really no other place for the water to go, to expand beyond the actual banks of the river, and to relieve the pressure from the storm. So I'm just saying all these things just to hope that this project goes through, that we realize that it's not a place that people can safely live, and that we continue along the track that this committee and the town in general is pursuing.

Question by Kim Wells: I wonder, Tim, if you can just show us where the existing 66 units that didn't get destroyed are?

It's mostly, this is what's known as the old section of the park [pointing to eastern end of the area where the homes were] that was originally built and this was an addition [pointing to the western portion of the area where the homes were] that was put in in the 1970s, 1970 say, I don't think it was beyond that, and most of the units that remain are in the old section of the park, including these shallower areas and over in here [pointing to original section]. This section [pointing to 1970 addition] got hit really hard. And it may not be as much as depth of water, although they were about the same, but the velocity that was reached as it ripped through here [pointing to the 1970 addition]. It really did some damage. It knocked them off their foundations, it flooded them, some of the ones down in here were up to and into the windows. So it was pretty bad. So the ones that remain are generally here [pointing to original section].

Question by Paul Harsch, Williamstown: Is it safe to say, Tim, that your conclusion as an expert, is that there's no practical, realistic, financially feasible way to address the flooding of the park?

I would first state that I wouldn't call myself an expert, but I've been doing this for the town for 25 years and, yes, that's my conclusion. I don't believe that there's a legal, technically feasible or financially feasible way to provide the level of protection that would be safe enough for people to continue to live there. That's my opinion.