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November 24, 2014

The Honorable Gerald Nabours
Members of the Flagstaff City Council
Flagstaff City Hall
211 W. Aspen Ave
Flagstaff, AZ 86001

Dear Mayor Nabours and Members of the Council:

I am in receipt of the letter from Dana Kjellgren to the Council dated November 17, 2014. I would like to respond to some of the points therein.

On page 6, paragraph 1 of her letter, Ms. Kjellgren declares Lowell Observatory and the United States Naval Observatory of no benefit to Flagstaff on the basis that they do not provide monetary benefit through remission of property tax or sales of goods, while the proposed Aspen Heights development will generate some \$400,000 in annual property taxes plus transaction privilege taxes and purchases during construction. I must assume her client was aware of this opinion and, since he concurred with its being submitted as a public document, that he agrees. The observatories have a major and far-reaching impact in the community, and the following is only a partial list of examples demonstrating this.

- Lowell Observatory constructed its \$53,000,000 Discovery Channel Telescope using labor in Flagstaff and northern Arizona, including a principal construction contract with a Flagstaff contractor. A 2005 study by NAU estimated the economic impact of the telescope over its lifetime to be in excess of one half billion dollars.
- The United States Naval Observatory has invested over \$70,000,000 in the Navy Precision Optical Interferometer at Anderson Mesa and is poised, beginning in spring of 2015, to invest over \$20,000,000 more at the Mesa and another \$40,000,000 at its station not far from the Aspen Heights property. A local contractor built the initial installation and is engaged to build the upgrade beginning next year.
- Dr. Gerard van Belle of Lowell Observatory authored a successful proposal to have Flagstaff host the 18th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, a leading international conference which brought 370 scientists from around the world to the High Country Conference Center 6-7 nights in June 2014. This created a significant economic impact in revenues to City entities (simple math suggests over \$260,000 in hotel revenue alone) as well as TPT revenue. We host events and workshops like this at least a few times every year, often more.

- The letter dismisses the 23 people who work at USNO because they do not sell wares. Lowell and USNO collectively employ about 125 people and their necessary skill sets encompass a variety of technical, high-paying jobs. These individuals remit their earnings in Flagstaff, and I can attest to their level of volunteerism and philanthropy throughout our community. How many employees will Aspen Heights bring?
- Lowell Observatory has formed partnerships for access to our Discovery Channel Telescope with Boston University, the University of Maryland, the University of Toledo, and Northern Arizona University. In 2015, we will form further partnerships with the University of Texas and the Korean Astronomy and Space Sciences Institute, and with Yale University. Scientists from these institutions continuously bring their faculty to Flagstaff to conduct observations, and they bring with them their students – bright young minds of tomorrow’s workforce looking for attractive and viable places to live.
- Because of the exemplary dark sky protection in Flagstaff and in Coconino County, the region is a serious contender for the \$130,000,000 Cherenkov Telescope Array, one of the flagship ground-based observatories of the upcoming 25 years. This facility would bring to the area yet another steady stream of researchers and students from CTA’s 28 countries and 1,200 participants. The assurance of long-term viability of the night sky is an essential component of our competitiveness for CTA, and it will be for future projects. Ours is one of the few remaining areas for what Mr. Diskan correctly called an astronomy “industry” – provided we have not abrogated sixty years of dark sky protection.

The assessment in this letter of the lack of economic value of Lowell and USNO to the community is patently false.

The letter also paints USNO as inconsistent based on the lighting usage of W. L. Gore’s facility in LZ1. Indeed USNO and Lowell did not oppose this development, or Flagstaff Ranch, or other developments in the area that were established *within the existing zoning*. The present code was a significant compromise in 1989 by USNO that allowed a 30% increase in sky brightness in its vicinity based on developing land in accordance with the existing zoning in the area. The 10,000 lumens/acre was an attempt to avoid a heavy-handed ordinance that intrudes too much on residential property usage; it allows homeowners the flexibility to install different fixtures on their property for the various purposes they might need, with the knowledge that single-family residential parcels use, on average, only about 600 lumens/house *at the same time*. Chris Luginbuhl’s calculations are not “arbitrary,” as the letter states, but are based on a thorough understanding of residential lighting usage.

The present action would change the land usage to one in which the entire area is saturated with the full 10,000 lumens/acre all night, every night, or 15 times the typical and expected rural residential usage. Even at the revised 6,300 lumens/acre, the lighting level is still 10 times the anticipated value. This will damage USNO’s ability to carry out its mission, and subsequent comparable development across 200 acres could destroy it.

Ms. Kjellgren also appears to blame USNO for establishing in 1955 a facility near Flagstaff that requires a resource Aspen Heights would now threaten, and for not having the prescience to remove themselves in 1980 in anticipation of a project 34 years hence. Lowell and USNO between them have a heritage in our city of 180 years; Aspen Heights has zero. Yet the clear message is that development – apparently of any type, regardless of long-standing interests in the area – is inevitable and USNO can now get out of the way. This ignores the required consideration of a zoning change to make sure it causes no harm to existing property owners.

The proposed development will cause harm to USNO, and the idea of a zoning change without regard to impact on nearby interests will have long term repercussions in the community. Furthermore, this action sets a development precedent for any future Zone 1 proposals. It is vital that we establish the right precedent not only for lands near the Naval Observatory, but elsewhere: City Hall, for example, is only nine miles line-of-sight from Anderson Mesa, where many tens of millions of new dollars are about to be invested.

I express my unqualified opposition to the Aspen Heights proposal, and urge a no vote from all members of Council on December 2.

I would be remiss, however, to end a letter to Council without proposing a way forward, as our Trustee Lowell Putnam also stated in his editorial on Sunday, November 23, to the Daily Sun.

This issue clearly calls for the need to re-examine both the outdoor lighting code as well as land use in LZ1. Mr. Putnam and I both support this effort, and we have both expressed this opinion personally to Mayor Nabours. We and USNO are open to adequately dark-sky-preserving development in LZ1. We recommend the formation of a multi-stakeholder committee to once again establish Flagstaff as a model – *the* model – for exemplary outdoor lighting. We did it 60 years ago when advertising searchlights were first proposed, 25 years ago with the adoption of low-pressure sodium as a citywide standard, and there's no reason we can't do it today in the LED era. We should reject Aspen Heights and give the proposed committee time to think about how we best manage lighting for development in LZ1, which will let us provide much better guidance in advance to prospective developers like Mr. Vatterott.

This will require effort and diligence from multiple agencies, and I pledge to provide that proactive effort from Lowell Observatory. Emerging technology and LZ1 development are challenging issues and I want to help find solutions, as I hope has been evident in recent LED discussions. Lowell Observatory benefits if Flagstaff is doing well, and I hope the reverse is also true. We want to help this happen.

For the moment, however, the difficult truth is that Aspen Heights is proposing to locate in some of the most sensitive 235 dark-sky acres in North America, proximate to the single field installation of the United States Naval Observatory, serving interests that are both civilian and of national security. The rezoning that would be required creates a unique circumstance that requires extreme sensitivity to the difference between 20,000 lumens and 200,000 or 300,000.

I hope Ms. Kjellgren and Mr. Vatterott know that I appreciate their efforts to reduce the overall lighting level, but when one is dealing with an impact that is unique in the United States, extraordinary situations arise.

At the opening of the August dark-sky conference, Mayor Nabours said in his remarks regarding the long tradition of dark-sky preservation in Flagstaff: "Tell us what to enact, and we will enact it." I much appreciate this positive stance from the Mayor toward Flagstaff's beautiful dark skies, and I would like to find the right thing for Council to enact.

Aspen Heights as proposed is not that right thing. Reject it. I hope the Mayor will then charge us, using information from the August conference and this lesson learned, to develop policy and procedure that maintains Flagstaff's world-leading position in dark-sky preservation. I encourage inclusion of the observatories, the City, the dark-sky coalition, and major entities such as NAU. I look forward to the conversations, and to once again putting Flagstaff at the leading edge of managing dark-sky preservation worldwide.

Yours sincerely,



Jeffrey Hall
Director
Lowell Observatory