



## ACTION CALENDAR

December 11, 2018

*(Continued from December 4, 2018)*

To: Honorable Mayor and Members of the City Council

From: Community Environmental Advisory Commission (CEAC)

Submitted by: Michael Goldhaber, Chair, CEAC

Subject: Referral Response: Mandatory and Recommended Green Stormwater Infrastructure in New and Existing Redevelopments or Properties

### RECOMMENDATION

Since the drought-storm-flooding cycle is predicted to get worse, refer to the City Manager to develop and implement measures to help reduce runoff from private property when rain exceeds two inches in a 24-hour period. The City Manager and staff should consider the following:

- Comply beyond the State and Alameda County current requirements;
- Encourage the treating and detaining of runoff up to approximately the 85th percentile of water deposited in a 24-hour period;
- Establish site design measures that include minimizing impervious surfaces;
- Require homeowners to include flooding offsets in preparing properties for sale;
- Offer option(s) for property owners to fund in-lieu centralized off-site storm-water retention facilities that would hold an equivalent volume of runoff;
- Require abatements for newly paved areas over a specific size;
- Make exceptions for properties that offer significantly below-market rent or sale prices;
- Authorize a fee for all new construction or for title transfer to cover the cost of required compliance inspections.
- Incorporate these measures for private property with similar measures for Public Works, while coordinating with EBMUD, BUSD, UCB and LBNL.

### SUMMARY

Current climate-change predictions for California suggest severe droughts combined with extreme storms, causing dangerous erosion, flooding, and increased Bay pollution. According to Berkeley's watershed management plan, in a 10-year storm or greater, both the Codornices and Potter Creek watersheds have a propensity to flood, and climate change increases the probability and severity of storms. BART and the city currently run pumps to mitigate the flow underground.

In order to prevent flooding, there is an urgent need for the City to offset impermeable surfaces and detain stormwater. Impermeable surfaces generate faster stormwater flows of more intensity (volume per duration), therefore creating greater flooding threats. In addition, stormwater flows carries trash, pathogens, pesticides, fertilizer, metals, motor vehicle related contaminants to the creeks and the Bay. Stormwater detention can help mitigate this pollution.

On June 14, 2018, the Commission voted to adopt the Mandatory and Recommended Green Storm Water Infrastructure in New and Existing Redevelopments and send them to council. [Motioned/Seconded: Hetzel/Kapla. Carried: Unanimously (Liz Varnhagen, Fred Hetzel, Robb Kapla, Michael Goldhaber (chair), Ben Gould, and Kristina Lim). Absent: Carla Ticconi, Holly Williams]

#### FISCAL IMPACTS OF RECOMMENDATION

If inspection fees are adequate, there should be no net costs to the City, except for staff time to firm up the plan. With widespread implementation of features that promote stormwater detention, treatment, and infiltration, overall flood damage within the City should decrease, which in turn could result in increased property values and higher tax revenues.

#### CURRENT SITUATION AND ITS EFFECTS

This report responds to Referral #2016-21, which originally appeared on the agenda of the September 15, 2015 Council meeting and was sponsored by then-Councilmember Arreguin.

The State stormwater discharge permit requires the City of Berkeley to use Low Impact Design (LID) and Green Infrastructure (GI) to comply with stormwater management requirements, which is in keeping with Berkeley's goals for promoting sustainable development.

Currently, the City does seem to be enforcing rules requiring mitigation when 2,500 square feet or more of new impermeable surface is added to a property. Required mitigation typically takes up an area of approximately 4% of the total new impermeable area and is therefore a very fair and feasible requirement. However, smaller areas, especially pavement, ought to require similar mitigation as they increase runoff.

At present, permits are not required for adding new pavement unless these impinge on the street-property boundary. As a result, the City and its inspectors are not aware of most small projects that add new pavement. Requiring permits for all (most) (re)paving over permeable surfaces will help ensure that the City is aware, can ask for appropriate mitigation, or can recommend permeable paving that will reduce runoff. Requiring permits for paving beyond a very small threshold area is an essential part of preventing the cumulative effects of increased stormwater runoff.

All these requirements can be met by using on- or off-site strategies to manage the quantity and quality of stormwater runoff. The approach integrates stormwater into the urban environment to achieve multiple goals. It reduces stormwater pollution and restores natural hydrologic function to the City's watersheds. It can also provide wildlife habitat and contribute to the gradual creation of a greener city.

A crucial aspect of identifying and implementing effective mitigation, also mandated by law, is within a comprehensive Watershed Management Plan, which we understand the City is committed to complete. This should include both water from private properties, the topic of this CEAC message, and the City's contributions from public properties including streets and parks.

### BACKGROUND

A recent UCLA study ["Increasing precipitation volatility in twenty-first-century California", Daniel L. Swain, Baird Langenbrunner, J. David Neelin & Alex Hall, *Nature Climate Change* 8, 427–433 (2018)] ... "found that over the next 40 years, the state will be 300 to 400 percent more likely to have a prolonged storm sequence as severe as the one that caused a now-legendary California flood more than 150 years ago.

"The Great Flood of 1862 filled valleys with feet of water and washed gold rush miners and their equipment out of the mountains. In the Central Valley, floodwaters stretched up to 300 miles long and as wide as 60 miles across." [*UCLA Newsroom*]

When there are heavy storms in Berkeley such as 10-year or greater, stormwater that is not absorbed runs downhill towards the Bay and collects in low elevation areas. As the movement of stormwater slows, it can result in flooding if drainage channels become overwhelmed, unless there are means of capturing the water for irrigation or other beneficial uses. It can also pick up pollutants that then will be carried into streams and eventually the Bay.

Urban development has caused two important changes in the nature and volume of stormwater. First, natural, vegetated permeable ground cover is converted to impermeable surfaces such as paved highways, streets, rooftops, and parking lots. Vegetated soil can both absorb rainwater and remove pollutants, providing a very effective natural purification process. This benefit is lost when pavement, or buildings are constructed. With the construction of more impermeable surface, stormwater runoff increases in intensity with higher flows of shorter duration, increasing the chance of overwhelming drainage channels and flooding in flood prone areas.

In addition, urban development creates pollution sources as urban population density increases. The contamination of urban stormwater comes from many and various sources including pathogens from both pet and human waste, solid waste from litter and trash, pesticides from both residential and commercial uses, fertilizers from

landscaping, and heavy metals and other contaminants from the operation of motor vehicles. All these pollutants and others can be deposited on paved surfaces, rooftops, and other impervious surfaces as fine airborne particles, thus yielding stormwater - runoff pollution that is unrelated to the activity associated with a given project site.

As a result of these two changes, stormwater discharges into the Bay from the developed urban area is significantly greater in volume, velocity and contaminants than the same area experienced prior to its conversion into an urban environment.

Additionally, increased flows and volumes of stormwater discharged from new impermeable surfaces resulting from new development and redevelopment can physically modify the natural aquatic ecosystems in our creeks, through bank erosion and deepening and widening of channels, elevating turbidity and sediment loads to the Bay.

Pollutants of concern in stormwater include heavy metals, excessive sediment production from erosion, petroleum hydrocarbons from sources such as motor vehicles, microbial pathogens of domestic sewage origin from illicit or accidental discharges, pesticides and herbicides, nutrients (from fertilizers), and trash.

Effective mitigation to offset the unpredictable and sometimes intense behavior of urban stormwater becomes increasingly necessary. Other cities, including San Francisco, Emeryville, and the North Bay Counties (Marin, Sonoma, Napa and Solano), as well as the Alameda County clean water program, of which the City of Berkeley is a member, have put together comprehensive requirements that are available as guides. Berkeley, given our pioneering status in green issues, should wish to be even more forward looking and develop our own comprehensive green infrastructure program. In addition, Berkeley should continue to work on a comprehensive water management plan, seeking input and cooperation from EBMUD, surrounding cities, UCB, LBNL and BUSD.

Berkeley's program should include requirements for construction projects to implement appropriate source control, site design, and stormwater treatment measures to address water quality, and to prevent increased intensity stormwater runoff volumes.

#### ENVIRONMENTAL SUSTAINABILITY

The proposed recommendation will improve the sustainability of new construction and redevelopment, increase the City's resiliency to climate change, 10-year storms, and flooding, while helping mitigate pollution from stormwater runoff.

RATIONALE FOR RECOMMENDATION

Berkeley's drought-storm cycle is likely to get worse as Climate change has more effecting the coming years and decades. Therefore, more efforts to control flooding and prevent pollution are needed. In addition, unless mitigated, increased paving on private property increases the stormwater runoff and related problems.

ALTERNATIVE ACTIONS CONSIDERED

CEAC considered City Council Referral #2016-21 from September 15, 2015 to develop an ordinance requiring large residential developments of 100 units or more or commercial developments that result in 5,000 square feet of new or replaced impervious surface, to incorporate Green Stormwater Infrastructure (GSI) and water conservation features into new projects.

CITY MANAGER

See companion report.

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