

SEATTLE PLANT FAILURE DUMPS MILLIONS OF GALLONS OF SEWAGE

SEATTLE: Millions of gallons of raw sewage and untreated runoff have poured into the United States' second-largest estuary since a massive sewage treatment plant experienced equipment failures that forced it to stop fully treating Seattle's waste. The county-run facility has been hobbling along at about half-capacity since the Feb. 9 electrical failure resulted in catastrophic flooding that damaged an underground network of pumps, motors, electric panels and other gear.

The sewage treatment plant - Washington state's largest - is only partially treating dirty water that goes down Seattle toilets and washes off roofs and roads before discharging it into Puget Sound. It's likely to face fines for violating federal clean-water laws. "It has been a disaster, and we're not out of it yet. We still don't know really what went wrong," said Jeanne Kohl-Welles, a King County councilwoman whose district includes the 32-acre West Point Treatment

Plant, on the shores of Puget Sound next to Seattle's largest public park.

"We've got to get a handle on it. I'm very concerned about the environment, the effects on marine life in the sound, public health," she added. County officials say crews have been working around the clock to repair about \$25 million in flood-related damages and bring the plant to full operations by the end of April. They note that raw sewage has not flowed from the plant since Feb. 16.

In the meantime, Kohl-Welles and other council members have launched an independent probe. They say they want to know what led to the breakdown and make sure this type of disaster doesn't happen again. The sewage spill is a potential black eye for a region that prides itself on its environmental consciousness. Years of work have gone into trying to clean up the nation's second-largest estuary, a vast inlet where water from the Pacific Ocean mixes with water draining from thousands of streams and rivers. One recent effort banned boats from dumping raw or partially treated sewage.

No widespread restrictions

In all, about 30 million gallons of raw sewage have poured into Puget Sound - during the initial breakdown and on two other occasions. "That's a big deal," said Heather Bartlett, water quality manager for the state Department of Ecology. There hasn't been a treatment-plant spill of this magnitude in recent memory. The county is in violation of its clean-water permit until the facility is fully

operational. "The longer it goes on, the greater the probability of an environmental effect," she added.

Untreated sewage and storm water can be harmful to people and aquatic life because they release chemicals and disease-causing germs. People also can get sick eating shellfish contaminated with bacteria from waste; however, most Seattle beaches are closed to shellfish harvesting, and the spill has so far led to no widespread restrictions. "Anytime pollution goes into the sound, it's a concern," said Sheida Sahandy, who directs the Puget Sound Partnership, the state agency in charge of cleaning up the sound.

But water-quality monitoring is in place, repairs are underway and an independent investigation will determine what happened, she said. Wastewater moving through the plant is getting primary treatment. Dirty water is screened to remove trash and debris, with some solids settling out, before it's disinfected, de-chlorinated and released through a 300-foot-deep emergency pipe designed to diffuse the waste into rapid currents. Since Feb. 9, there has been no secondary treatment, a process that relies on beneficial organisms to clean the waste and is required by federal clean-water laws.

Making changes

Beaches that closed because of the initial spill reopened Feb. 21. County officials have been sampling weekly since the spill. Tests of fecal bacteria, dissolved oxygen and nutrients have been normal. "So far, we have not seen

anything that looks out of the realm of normal," said Kimberle Stark, who manages King County's marine monitoring program. She doesn't expect to see other effects to wildlife because the spill was short and the flow is now being sent through deep-water pipe. Linda Peters, who lives near the plant, said she runs in the area twice a week and can still smell the sewage.

"The idea that sewage is in the water is just terrible," Peters said. "The fact that it could happen and that it wasn't anticipated - it's disturbing." Events unfolded quickly in the early hours of Feb. 9. Power went out to two sets of pumps that discharge treated wastewater into Puget Sound. Float switches designed to detect high water levels inside the tanks also failed, allowing water to top over and flood surrounding areas. Crews worked fast to divert the flows to bypass the plant and go directly into the sound, but the flooding damage was done.

While rain did not cause the electrical failure that set problems in motion, it certainly exacerbated it, said Robert Waddle, plant operations manager. The facility typically handles about 90 million gallons a day, but it was near peak with 440 million gallons because of heavy rain. In the meantime, crews have been working hard to get the plant up and running, replacing motors, lights, pumps and other equipment. As the plant puts things back together, Waddle said they're making changes and adding redundant systems in some cases. "My job is to make sure it doesn't happen again," Waddle said. —AP



CALIFORNIA: In this file photo, the Tijuana River flows near Dairy Mart Road in San Ysidro, California. —AP

NEW YORK SKYSCRAPERS ADAPT TO CLIMATE CHANGE

BUILDINGS DESIGNED TO EVOLVE AROUND GLOBAL WARMING

NEW YORK: With a skyline crowded with ever-more luxury towers, the construction of another Manhattan skyscraper wouldn't normally be remarkable. But the American Copper Buildings going up on the East River—a complex of two towers with 764 apartments, panoramic views and a huge entrance hall with a doorman—is different.

Planned just after deadly Hurricane Sandy ravaged New York in October 2012 sounding another alarm about the mounting effects of climate change—it was designed with new threats in mind, reflecting how the real estate world is evolving to account for global warming, in contrast to US President Donald Trump's moves to roll back environmental protection. The huge storm killed more than 40 people in New York, paralyzing the US financial capital for days.

JDS, the company developing the American Copper Buildings, bought the land for the project around the same time. "The whole

thing was a lake, we could have toured the site in a canoe," said Simon Koster, a principal at the company. "We knew something like that would happen again," he added. "So we said, 'How can we make sure that if we lived here, we will not be facing that scenario?' So we let the designers loose."

Tools to survive

One of the main innovations was to ensure residents have access to electricity as long as possible in the event of an outage in the city. Instead of planning an opulent penthouse on the top floor, the architects reserved space for big natural-gas generators designed to keep key equipment functioning if the power fails. Although the machines are situated "in the most valuable real estate of this building," Koster said, "it makes all the other units all the more valuable."

"We are going to have more of these events, it's just being strategic and smart about how you pre-

pare for them," architect Gregg Pasquarelli said. "If we lose power, if you can go up and down in the elevator and your refrigerator works and you have one outlet available that you charge your phone on, you can probably survive in New York for a week," he added. Every kitchen has two electrical outlets reserved for refrigerators connected to a back-up circuit fed by the generators.

That means smartphones can be charged during a breakdown. Traditionally relegated to the basement, the heating, ventilation and large electrical equipment have been installed on the first floor instead, more than 20 feet above the street to minimize the risk of flooding. The main entrance hall is large and austere, with steel pillars and floor tiling designed for outside use.

Wood-paneled walls warm the atmosphere—but the open side panels can dry easily with no damage in the event of flooding. The building's

cheapest studios will be available for rent starting from \$3,000 a month, and include the luxury perks of access to a swimming pool and huge terrace with views of the Empire State Building in addition to the more prosaic bonus of flood resistance.

Embracing resilience

New York is embracing resilient architecture more than most cities in the country because its exorbitantly priced real estate drives up the financial stakes, says Alex Wilson, president of the Vermont-based Resilient Design Institute, which specializes in such issues. Besides electricity, architects are also coming up with ways of providing drinking water—with accessible faucets for everyone now obligatory on lower floors—as well as maintaining reasonable temperatures.

In the event of a summer power outage, "a lot of condominiums are heavily glazed and would become uninhabitable," Wilson said. The city is identifying the most vulnerable existing buildings for adaptation. However, the obstacles for reconstructing older structures are greater than integrating flood resistance during the construction of new projects such as the Copper Buildings—and so are the costs—Wilson said. Politics may also get in the way.

The Trump administration plans to slash the Environmental Protection Agency's budget, which may affect the collection of data to assess weak infrastructure. "If the government stops collecting the data on flooding vulnerabilities, heat waves, then it's going to be harder for the design and development communities to incorporate changes in their design," Wilson said.

Still, he's optimistic the government's rejection of science about the effects of climate change will have only a temporary effect. "The private sector is well aware of this, the insurance industry is increasingly aware of this and these industries will continue to drive progress in resilience." —AFP



TOKYO: A young boy views at a replica of a Fukuiraptor Kitadaniensis, during an exhibition sponsored by the local government of the Fukui prefecture in Tokyo. —AP photos

NEW IDEA SHAKES UP DINOSAUR FAMILY TREE FOR T REX AND PALS

WASHINGTON: Tyrannosaurus Rex and his buddies could be on the move as a new study proposes a massive shake-up of the dinosaur family tree. Scientists who took a deeper look at dinosaur fossils suggest a different evolutionary history for dinosaurs, moving theropods such as T. Rex to a new branch of the family tree and hinting at an earlier and more northern origin for dinosaurs.

The revised dinosaur tree makes more sense than the old one, initially designed more than a century ago based on hip shape, said Matt Baron, a paleontology doctoral student at the University of Cambridge in England. He is the lead author of the study in Wednesday's journal Nature. "If the authors are correct, this really turns our longstanding understanding of dinosaur evolution upside down!" Kristi Curry Rogers, a paleontologist at Macalester College in Minnesota who wasn't part of the study, wrote in an email.

Dinosaurs are split into two groups. One group has bird-like hips and is called Ornithischia (or-ni-THISS'-kee-a). It includes the stegosaurus. The group with reptile-like hips is called Saurischia (saw-RIS'-kee-a), and includes the brontosaurus. Theropods, which include T Rex and the type of dinosaurs that later evolved into modern day birds, were considered an offshoot from the group that includes the brontosaurus. The new study moves them to the group that includes the stegosaurus, but on a different branch.

"It means that animals that we've always thought were very closely related to each other might not be," said Rogers,

who praised the study, saying it prompts a whole bunch of new questions. Baron and colleagues looked at 450 characteristics of 75 dinosaur species. They used computer simulations to try to group together those with similar characteristics, creating tens of thousands of potential dinosaur family trees. The proposed one combines the 80 most likely scenarios, he said.

It may sound like an academic exercise, but it's important to understand how big animals changed with time, Baron said, noting that the dinosaurs ruled Earth for more than 150 million years. His research suggests that dinosaurs popped up 247 million years ago - 10 million years earlier than the standard theory says - with a dinosaur from Tanzania in East Africa. It's called Nyasasaurus, was 6 to 10 feet tall and a plant-eater.

He also found an animal that's not quite a dinosaur, but as close as you can get, that is a reptilian ancestor. And it was in Scotland. Previous theories pointed to dinosaurs first evolving out of the Southern Hemisphere and many outside scientists said there wasn't enough evidence to support Baron's northern concept.

The paper is already dividing dinosaur experts. Famed dinosaur expert Paul Sereno at University of Chicago called the basis of the Baron family tree "weak" and said "the central question the paper leaves unanswered for me is why?" Matthew Carrano, dinosaur curator at the Smithsonian Natural History Museum, said it's hard to side with any theory because early dinosaur fossil records are so incomplete. —AP



NEW YORK: A model of the building stands in a room inside the American Copper Building at 626 First Avenue in New York. —AFP

PEOPLE WITH TYPE 2 DIABETES NEED TO GET OFF THEIR CHAIRS

NEW YORK: People with type 2 diabetes who sit all day have a riskier blood fat mixture than those who move around or exercise periodically throughout the day, according to researchers in Australia. "We have previously shown that interrupting prolonged sitting with light intensity activity after meals reduces risk factors for heart disease and diabetes, such as elevated blood sugars and high blood pressure," said lead author Dr. Megan S. Grace from Baker Heart and Diabetes Institute and Monash University in Melbourne.

Past research has also shown that patients with type 2 diabetes have an altered blood fat profile that contributes to inflammation and insulin resistance and that exercise can improve this profile. "What we found interesting about this study was that breaking up sitting also reduces levels of lipids (fats) in the bloodstream that are associated with risk for type 2 diabetes and its complications," Grace said by email.

"Our study showed that breaks which include either simple resistance exercise or light walking were generally equally beneficial in reducing

blood lipids." Researchers looked at blood lipid profiles in 21 overweight or obese adults with type 2 diabetes under three different conditions: sitting throughout the day (rising only to use the bathroom); breaking up sitting by light walking for three minutes every 30 minutes; and breaking up sitting by doing light exercise like squats and knee raises for three minutes every 30 minutes.

During sitting, and especially after meals, the lipid profile reflected an inflammatory state that also lacked the antioxidants needed to fight inflammation, according to the results in the Journal of Clinical Endocrinology and Metabolism. Both light walking and light exercise changed this profile into one that was less inflammatory and had a greater capacity for fighting inflammation. Light exercise also improved fat-burning capacity.

"Our current findings reinforce the message that avoiding prolonged periods of sitting, and finding ways to increase activity across the day, is beneficial for health," Grace said. "In line with the recent American Diabetes Association Position Statement, we recommend interrupting

sitting every 30 minutes with a few minutes of light intensity activity, in addition to regularly taking part in a structured exercise program."

Her best advice: "Stand up, sit less, and move more - particularly after meals." "The results are novel and important because they identified new mechanisms to explain why sitting time has been linked with poor health," said Dr. Sarah Kozey-Keadle from California Polytechnic State University in San Luis Obispo, who has studied ways to reduce sitting time and increase physical activity.

"Although not directly addressed in this report, the most important message related to physical activity is that exercise can prevent the onset of type 2 diabetes and prevent complications for those who already have type 2 diabetes," she told Reuters Health by email.

"The second message is that there are health benefits for replacing and breaking up sitting time with activities that are not considered exercise, such as standing and lower intensity activities of daily living, especially for people who are currently less active," Kozey-Keadle said. —Reuters



WASHINGTON: In this file photo, a cast of a Tyrannosaurus rex discovered in Montana greets visitors as they enter the Smithsonian Museum of Natural History in Washington.