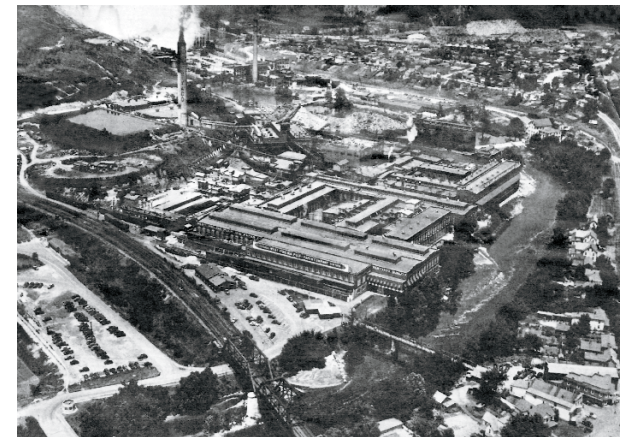


General Electric U23B No. 2300 rumbles past the Back Creek Paper warehouse on Joe Green's 30 x 31-foot HO scale Chesapeake & Ohio Ryder Gap Subdivision. Joe designed a track plan to see how the paper mill might look as a single-industry layout designed to fit in a spare room.



This 1947 aerial photo of the sprawling West Virginia Pulp & Paper (Westvaco) paper mill at Covington, Va., clearly shows why Joe had to make his track plan much more linear and compact. The Chesapeake & Ohio main line is visible at left. Westvaco photo, author's collection

# A paper mill in a spare room

This track plan for a single-industry HO scale layout fits in a 10 x 14-foot space

By Joe Green • Photos by the author unless noted

**Modeling the Westvaco Pulp & Paper** mill in Covington, Va., was an easy decision. It was by far the largest Chesapeake & Ohio customer in the region where my proto-freelanced HO scale C&O Ryder Gap Subdivision is based (see *Model Railroad Planning 2021*) and would create significant traffic for my 1974-era switching layout.

The Westvaco plant was huge, stretching out over more than three-quarters of a mile. I allocated the full length of one side of a 26-foot peninsula with the goal of designing an industry that captured its look and feel, while also keeping a crew busy switching for an entire operating session. A paper mill would help justify the existence of the Ryder Gap Sub in the turbulent 1970s.

But what if I didn't have a 930-square-foot train room? Could the design of Back Creek Paper, the name I'd given my version of the prototype facility, be the basis for a single-industry layout in a 10 x 14-foot spare room? The goals for the new layout included:

- Reuse as much of the existing design as feasible
- Ensure the new plan retains its grounding in the full-size Westvaco mill
- Support a 2- to 3-hour operating session with a single crew.

Focusing on a large industry allowed the original layout to be less compressed and feel more realistic. It also encouraged me to research the paper industry in general and the Westvaco mill specifically so I could develop a credible representation of the overall business.

## Researching the Westvaco mill

I started by looking for Westvaco's track plan in documents available from the Chesapeake & Ohio Historical Society (cohs.org). The prototype had 20 to 25 industrial sidings, which were accessed from the main lines of two separate subdivisions that joined in the Covington Yard less than a mile east of the plant. The track plan also indicated that a number of these sidings were located inside the mill a good distance away from the adjoining main line.

I have only a few personal photos of Westvaco taken well after the 1970s, so I

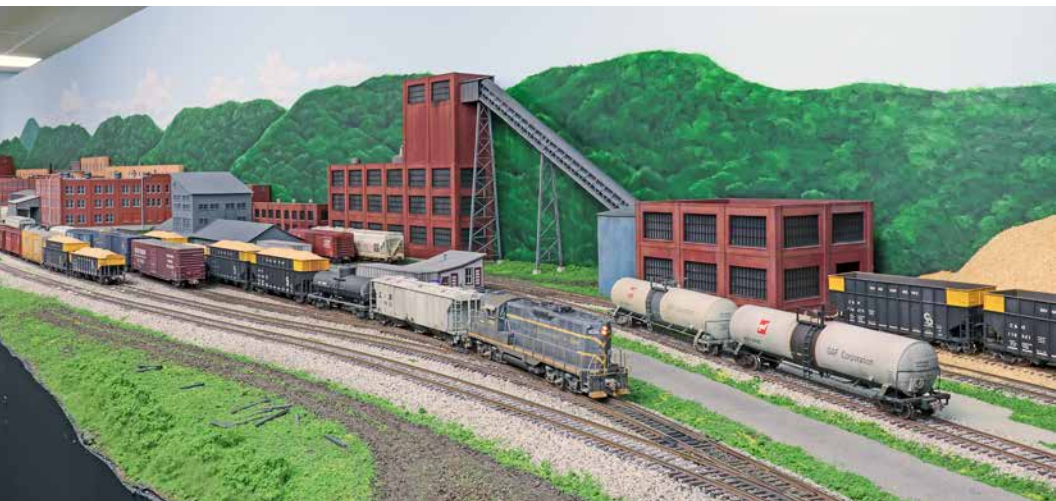
began searching online for additional pictures to use for my design and modeling. I stumbled into a gold mine, Steve Nicholson's website ([freepages.rootsweb.com/~alleganyhighlands/history/](http://freepages.rootsweb.com/~alleganyhighlands/history/)) that contained hundreds of photos of the mill from the early 1900s into the 1990s.

The website also had two other treasures. The first was a series of site diagrams from 1929 with names for many of the industry's buildings like the Digester, the Beater Building, the Bleach Room, the Machine Room, the Calendering and Cutting Building, and the Finishing Building. I recognized the opportunity to include these structures within my design.

The second surprise was a 20-plus page history of the mill. After its original development in 1900, the industry was expanded several times, including major building programs in the 1920s and in the late 1940s. As source materials and architectural styles evolved over time, the subsequent building programs created a visible history throughout the complex. Structures built at the same time tended to have the same architecture and colors, while buildings constructed decades later often have a different construction style.

I wrote to Westvaco to ask whether they had any photographs of the plant. I was delighted to receive an envelope from the mill containing a few photos, including two large aerial shots from the 1940s and 1950s.





Over at the pulp mill, a C&O Geep pulls a boxcar loaded with activated carbon. The material, a byproduct of the pulp-making process, is used to purify water and other commercial products.

### What's in those cars?

One advantage of modeling a pulp and paper mill is the wide variety of railroad cars they require [See "Car selection" on page 46. - Ed.] Pulpwood cars and wood-chip hoppers feed the pulp mill, coal hoppers go to the powerhouse, and boxcars are used to ship paper. There are also a sizable number of covered hoppers, tank cars, and boxcars of inbound chemicals used throughout the paper-making process.

But what are those chemicals? Early in my research, I found a document on the Operations Special Interest Group website (opsig.org) listing 15 chemicals that could be used in a pulp and paper

mill, what they would be used for, and what type of cars they would arrive in. Chemicals included kaolin, starch, chlorine, sodium chlorate, sodium hydroxide (caustic), sodium sulfate (salt cake), and lime. I chose a subset of these chemicals to be received at various sidings within Back Creek Paper. I also found that there are additional byproducts that can be shipped from a pulp mill, such as activated carbon, turpentine, and tall oil.

Deciding where to locate the sidings for each of the chemicals fluctuated from design to design. My curiosity finally got the better of me. How do you make pulp? How do you make paper? A Google search of these questions produced articles, videos, chemical

A view of the east end of the mill shows C&O GP9 6034 leading the Mill Job. Note the pile of woodchips at right and the conveyor that carries them up to the Digester building, where the pulping process begins. The gray structure is the activated carbon warehouse.

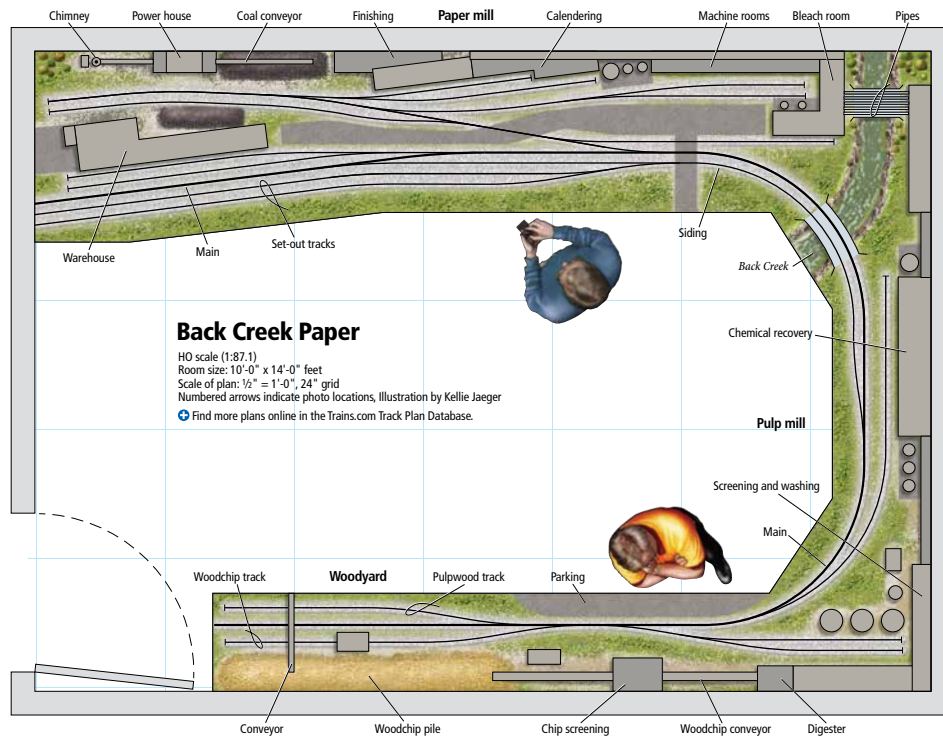
equations, and more. Although often more than what I needed, I better understood what I was trying to model.

One key learning point was that a sulfate, or kraft, pulp mill such as Westvaco was different than a sulfite mill, each using a different set of chemicals. Through this research I was able to better identify the flow of materials through the site and the location where specific chemicals would need to be unloaded.

### Modifying the plan

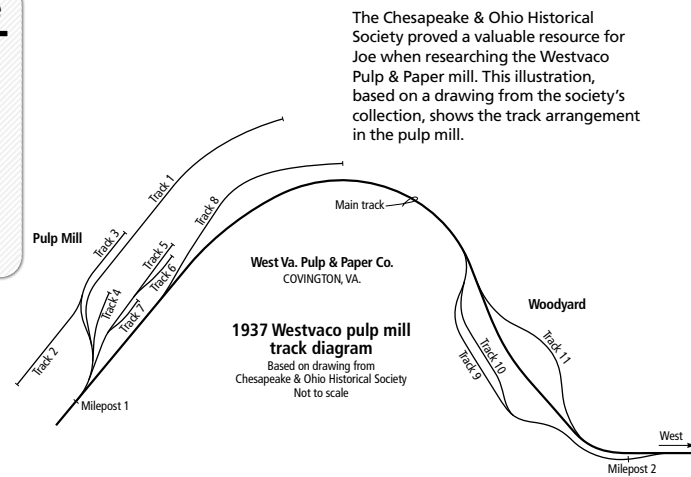
My first decision to make was how to bend the existing linear track plan around a U-shaped area. The U-shaped approach would allow plenty of length for the industry while also providing a wide center aisle for easy access. The paper mill side of Back Creek Paper worked best, and I chose to keep it virtually intact along one 14-foot wall. The pulp mill was cramped, and the new design let me spread it out more realistically and for better operations.

The next decision was how to adapt the siding and two set-out tracks by Back Creek Paper. A 1937 C&O track chart showed the two set-out tracks by the prototype Westvaco facility approximately three-quarters of a mile from the main body of the Covington, Va., yard. I don't know if the tracks still had this



### The track plan at a glance

**Name:** Back Creek Paper  
**Scale:** HO (1:87.1)  
**Size:** 10 x 14 feet  
**Prototype:** Westvaco Pulp & Paper mill  
**Locale:** Covington, Va.  
**Era:** 1974  
**Style:** around-the-walls  
**Mainline run:** 28 feet  
**Minimum turnout:** 30"  
**Minimum turnout:** No. 6  
**Maximum grade:** none



The Chesapeake & Ohio Historical Society proved a valuable resource for Joe when researching the Westvaco Pulp & Paper mill. This illustration, based on a drawing from the society's collection, shows the track arrangement in the pulp mill.





Back Creek separates the paper mill and pulp mill. Directly behind the Chesapeake & Ohio Electro-Motive Division GP9 diesel locomotives is the Beater Room, where pulp and water are combined ("beaten") and prepared for the paper machine.



A Chesapeake & Ohio GP9 switches chlorine-filled tank cars on the Bleach Track. The Geep is an Athearn Genesis model equipped with a SoundTraxx Tsunami sound decoder; the tank cars are Atlas models.

purpose in the 1970s, but I kept them to enhance operations.

The new layout assumes that Back Creek Paper is on a lightly used branch line with one eastbound and one westbound freight that swap blocks of cars in the set-out tracks overnight. A local switcher works the mill during the daytime, spotting the inbound cars from the set-out tracks and pulling outbound cars that have been released.

It was essential that there be adequate track length for the switcher to pull a full cut of cars out of the set-out tracks and sort them. To do so, the tracks were retained on one end of the layout, but they were shortened significantly to give the switching engine sufficient clearance. Assuming a mix of 40- and 50-foot cars,

the two tracks will hold a maximum of 24 cars, enough for an interesting operating session. We will assume the tracks are double-ended with unmodeled turnouts past the west end of the layout.

Similarly, the siding also needed to be shortened, as we needed to be able to maneuver a cut of cars from each end. So it was located with adequate mainline length on both sides.

### The paper mill

The Westvaco plant isn't only long, but it's also deep. The industrial sidings are often within brick canyons some distance from the main line. Re-creating this effect within the model paper mill started by having a row of buildings in

## Car selection

It took me a while to recognize that the cars spotted at Back Creek Paper would become an important part of whether it looked prototypically accurate or not. This applied not only to the type of car, but also to the car ownership.

I initially collected a wide variety of cars, but when together, they didn't look particularly realistic. Even a large mill is likely to have only a few suppliers for any one inbound commodity, so acquiring a car fleet with multiple cars from the same supplier looks more realistic than one that has too much variety.

— Joe Green

front of the industrial sidings and a row of flats behind them. To add to the sense of depth, there are two layers of flats where possible.

Because operating the layout is an important priority, the design has ample space for people to reach into the industry to uncouple cars where needed, foregoing some of the brick canyon effect.

The paper mill side of the plant features eight of the 10 prototype industrial sidings. Following the prototype, the paper warehouse spurs are accessed from the main, while the remaining tracks are reached via a long switchback. The switchback creates several long sidings that provide ample track length for storing cars temporarily while working within the paper mill.

This creates a couple of visual anomalies, however. The coal track is on the wrong side of the powerhouse and coal pile, while the paper warehouse is cut off from the main body of the facility (there must be a tunnel underneath the tracks).

### The pulp mill and woodyard

In keeping with the theme of reusing the existing design, the reworked pulp mill and woodyard retain Back Creek Paper's five industrial sidings, albeit spread out over a longer area. The benchmark is 18" wide; my increasingly cranky back has made me appreciate not having to lean over the layout quite so much. Wider benchwork, if desired, would allow for more depth in the scenes and possibly additional tracks. Westvaco had 11 sidings, so adding more would be in line with the prototype.



After working the Bleach Track, the morning crew switches covered hoppers carrying sodium chlorate, which is converted to chlorine dioxide as an additional bleaching agent. The main line, siding, and two setout tracks are visible in front of the engine.

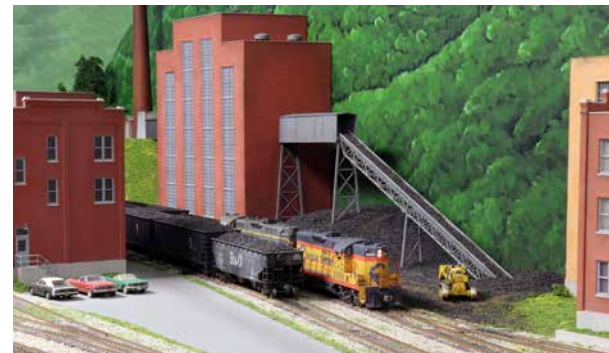
The woodyard is split by the main line, just as the Hot Springs branch does at the Covington mill. The pulpwood track is intentionally set near the front edge of the layout, so the pulpwood piles don't need to be modeled. Creating a realistic wood-chip pile with screened sawdust over an underlying form is far easier than cutting hundreds if not thousands of pulpwood logs.

The Westvaco paper mill and pulp mill are separated by the Jackson River with an extensive set of pipes connecting the mills across the river. The layout uses Back Creek to separate the two mills. The creek curves around the buildings so that its transition to the backdrop is hidden from view.

### Large-scale operations

A typical day starts with 20 cars in the eastbound and westbound set-out tracks. Back Creek Paper requires that the pulp mill and a specified part of the paper mill be worked in the morning, while the woodyard and the rest of the paper mill are worked in the afternoon. The AM Mill Job starts by sorting the necessary cars from the setout tracks into the siding. The crew then works the two mills, spotting inbound cars and pulling released cars. The cars they pull from the plant are sorted in the siding into eastbound and westbound blocks.

The PM Mill Job begins by swapping the remaining inbound cars in the set-out tracks with the outbound blocks in the siding. The crew next works the woodyard before servicing the second half of the paper mill. Once again, cars



Back Creek Paper generates its own power, consuming carloads of coal every day. Here, a pair of Chesapeake & Ohio GP9s pulls a cut of empty hoppers from the track in front of the powerhouse.

pulled from the plant are sorted into eastbound and westbound blocks in the appropriate set-out tracks.

Like their prototype counterparts, conductors can write switch lists to tell them where to spot the inbound cars. Back Creek Paper's traffic manager can provide switch lists and other documentation to specify what cars should be pulled from or re-spotted within the sprawling mill.

There's space for approximately 45 cars within the facility, although a session might normally start with 35 cars. In this scenario, 15 cars will not be pulled, taking a prototypical second day to be loaded or unloaded. Each crew, working with roughly 10 inbound and 10 outbound cars, will feel like they are

switching only a part of the large industry at any given time.

### A new beginning

Back Creek Paper is a signature scene on my Chesapeake & Ohio Ryder Gap Subdivision model railroad. As shown here, it can also be the basis for an HO scale layout in an 10 x 14-foot spare room. The single-industry layout would be rewarding and fun to build and provide many hours of operating fun. [MRR](#)

*Joe Green is a retired computer software manager who lives in Sequim, Wash., with his wife, Janet. He also enjoys solving kakuro and sudoku puzzles, watching sports, and walking.*