Gravitational redshift (potential well) query?

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If you take a sphere of a given Radius (R) and Density (D) and have a photon travel out from the center, it will experience a gravitational redshift according to Zg=4.19GDr^2/c^2 (where r is the distance traveled from the center and is less than R at this point, r < R).
This is a standard photon climbing out of a potential well problem taken from physics textbooks.
{To better visualize it, lets say we are at the center of the earth and shoot a photon back towards the surface through a open shaft}

Lets assume the sphere is embedded in a background density of D1. {Which in the earth case would be the density of the universe, (i.e. critical Density), ignoring local lumpiness} Now distance R or density D1 do not come into play here due to Gausses theorem. This is reflected in the equation since neither is present. In other words we should be able to vary R and D1 to any value and the equation should still hold true.

Now my question is this:
Would we still get a redshift as D1 approaches D and eventually equals D?
The answer appears to be "yes it has to" since the photon can never know about (i.e. feel the effects of) values D1 or R due to Gausses theorem!
But this gives rise to an interesting problem if D=D1.
You may see it already.

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