

**HW#7****Assigned: Friday, October 23, 2009****Due: Tuesday, November 3, 2009**

Use HW #3, case 2 as a reference: explicit solution,  $\Delta t = 0.1 \text{ day}$ ,  $NX = 20$ ,  $\Delta x = 5 \text{ ft}$ ,  $\Delta y = 10 \text{ ft}$ ,  $\Delta z = 10 \text{ ft}$ ,  $\phi = 0.20$ ,  $t_{max} = 10 \text{ days}$ ,  $u_T = 10 \text{ ft / day}$ . Add end effects to the output node using  $S_{w,end} = 0.5$ .

$$\text{Flow equation: } -u_T \frac{f_{wi}^n - f_{w,i-1}^n}{\Delta x} = \frac{S_{wi}^{n+1} - S_{wi}^n}{\Delta t}$$

End effects: if  $S_{w,IMAX}^n < S_{w,end}$ , then  $f_{w,IMAX} = 0$ , else  $f_{w,IMAX}^n = f_w[S_{w,IMAX}^n]$

- (a) Compare the plot for HW #3, case #2 with the same plot for this problem ( $S_w$  vs x for various times)
- (b) Plot the oil recovery factor vs time for both problems and compare