Time complexity:

N — the dimension of the board

For calculating the Number of possible moves, the time complexity would be $O((4N - 1)^2)$, that is $O(N^2)$.

For calculating the Number of hexagonal cells available for capture by a single move, since we separate the board into two parts. one is from the first layer to the middle layer and the time complexity for this part is $O((3N - 1)N/2)$. The second part is the left layers and the time complexity for this part is $O((3N - 2)(N - 1)/2)$. In summary. that is $O(N^2)$.

For calculating Maximum number of hexagonal cells that can be captured by one move (0, 1, 2), our algorithm goes through all hexagons and records all coordinates of edges which could be used to capture one hexagon. The time complexity of this algorithm is related to the size of the list which stores all coordinates of edges which could be used to capture one hexagon. That is linear.

In summary, the time complexity of the whole algorithm would be $O(N^2)$.