



PROJECT SHATTERSTAR



VOLUME 1 OF GUIDE TO THE ONI-VERSE

OXYGEN
NOT INCLUDED

SPACED
OUT!

By-
the stormfather

CHAPTER 10 : Nuclear Enrichment







Not every Uranium refinery is made of metal.

Stormfather

Make love not war. ONI doesn't have nuclear weapons in it (yet) but I'm sure some refined uranium will come in handy....

Highlights :

-  We land on 2 more planets
-  We finally find Iron!
-  We increase our crude production
-  We enrich some Uranium

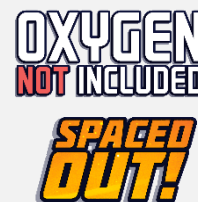
<https://linktr.ee/Stormfather>



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CH 10: Nuclear Enrichment



Disclaimer-

Oxygen Not Included is a sandbox game limited only by the player's imagination. I can assure you that no player (including me) has figured out the 'right' way to play the game.... No matter how many hours they may have put into the game.

That's because there is no right way. What you do depends on what you want to achieve. Some love building ridiculous and elaborate builds, while others are more efficient and practical. Both are perfectly acceptable ways to play. What matters is that you enjoy what you do.

The following document is a guide and not a gospel. Like every other player, I have my unique style of play. What I intend to do is to share my playstyle and start a conversation with the community. This document will take you through a real and typical game, showcasing my approach to things. The playthrough will not be perfect. But it will be enlightening and entertaining. I hope my readers will use this series to modify their own unique style rather than copy mine.

Feel free to skip, ignore or modify any of the recommendations given in the series.

All Game art has been taken from the game files and is the property of Klei (if that wasn't obvious enough). I've used them only to make the document more engaging.

While this guide is quite simple, It's not meant to spoon-feed you. You may have to do a bit of additional research if you are a new player, and I'm happy to answer any specific questions.

The easiest way to find me is on Reddit. My handle u/Storm-Father. Please feel free to drop me a message or tag me in a post.

The series will use the following mods. These are quality-of-life mods and do not affect core gameplay

- | | |
|---|--|
| ● Wounded go to Med bed | ● Geyser Calculated Average Output tooltip |
| ● Per-planetoid materials | ● Critter Inventory |
| ● Blueprints fixed | ● Queue for Sinks |
| ● Pliers fixed (No longer needed with the Feb 2023 update) | ● FreeCamera |
| ● Bigger Building Menu | ● MaterialColor |
| ● No 'Long Commutes' | ● Show industrial Machinery Tag |
| ● Suppress Notifications | |

Game Coordinates – 'SNDST-C-360860549-0'



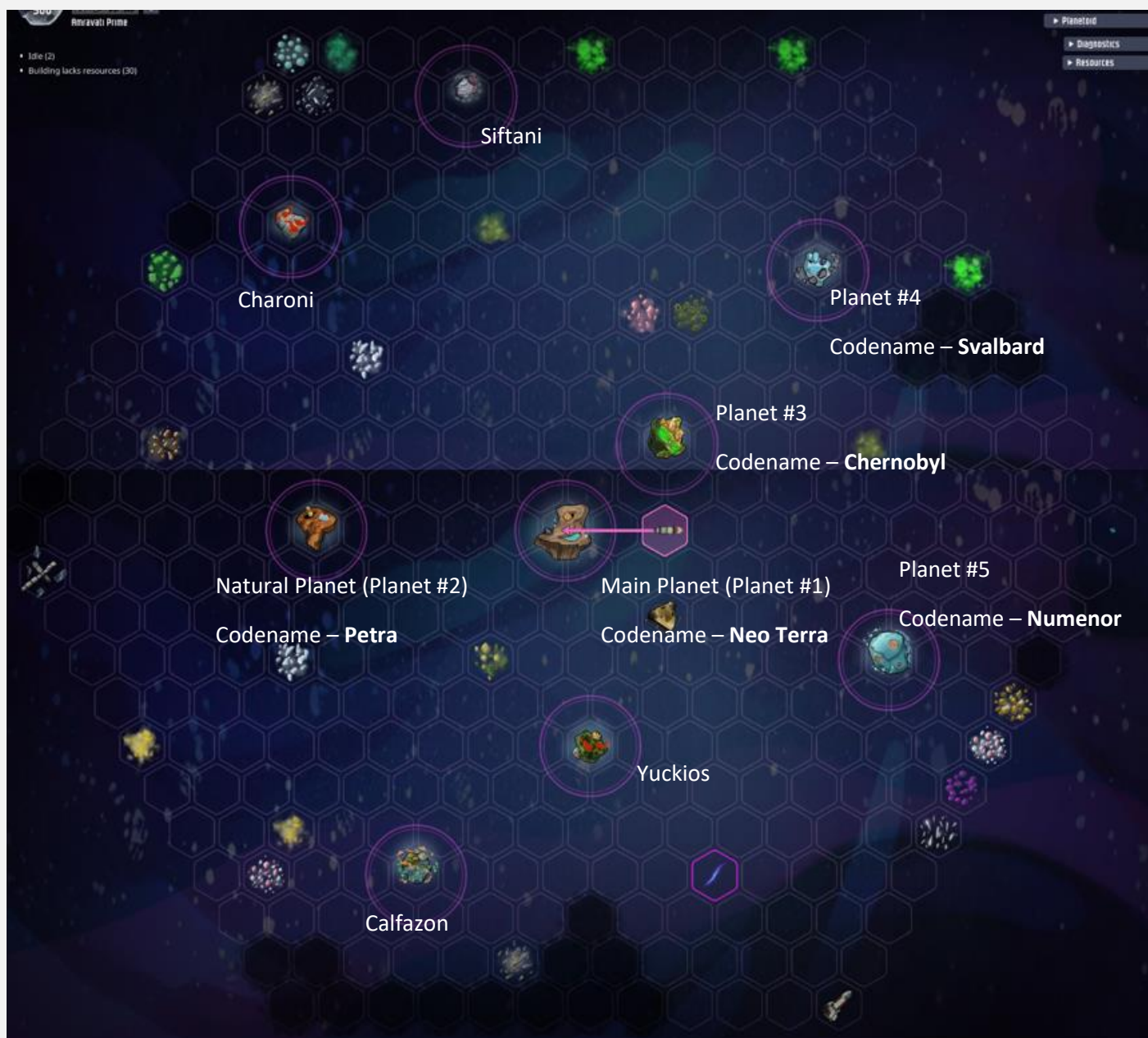
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CH 10: Nuclear Enrichment

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The Starmap



The layout of the introduction has been changed to accommodate the increase in information that comes from having multiple planets. If you have any suggestions on alternate layouts or additional information, feel free to let me know on Reddit.



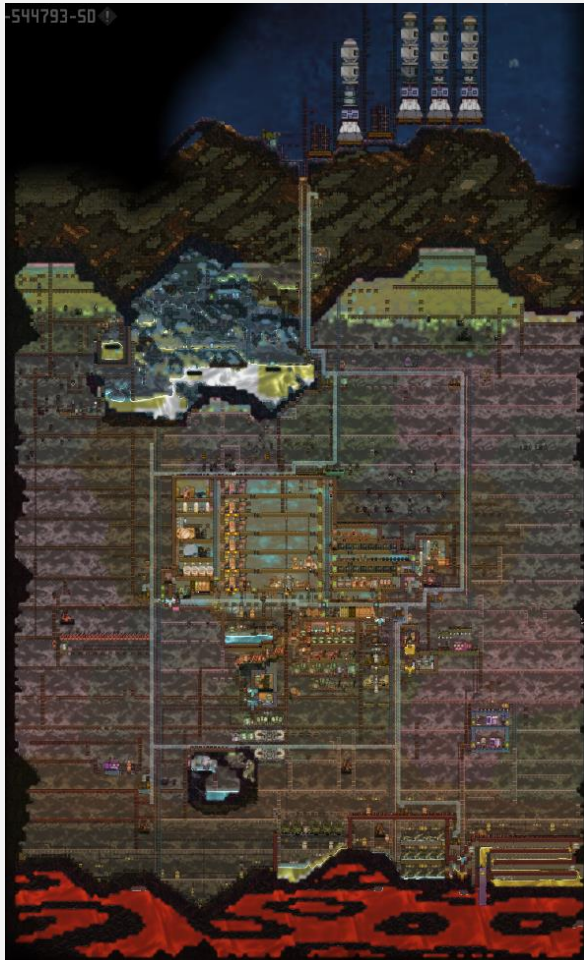
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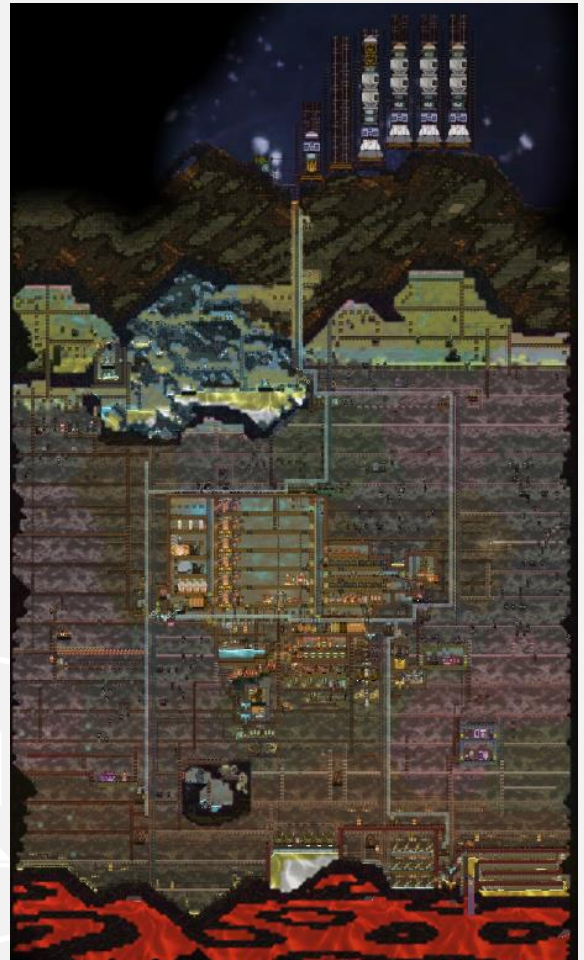
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Neo Terra

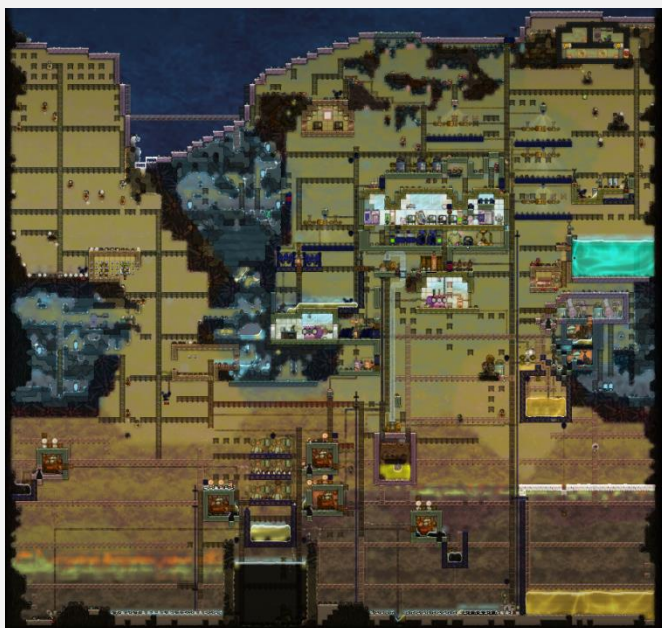


Cycle 500

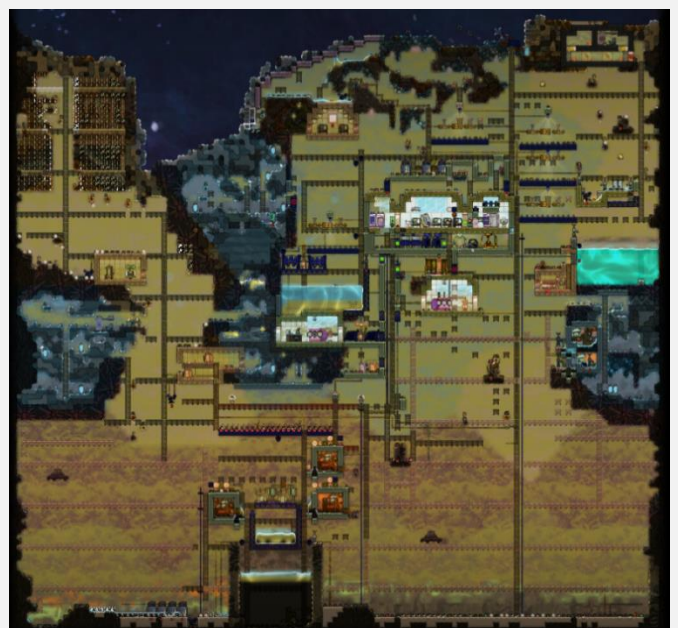


Cycle 400

Petra



Cycle 500



Cycle 400



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CH 10: Nuclear Enrichment

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Chernobyl



Cycle 500

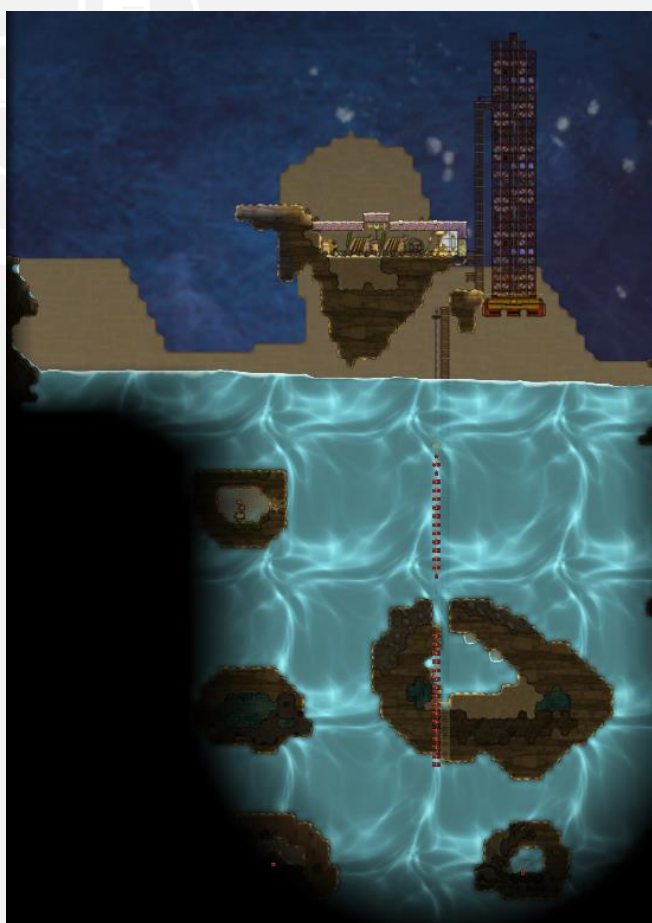
Cycle 400

Svalbard



Cycle 500

Numenor



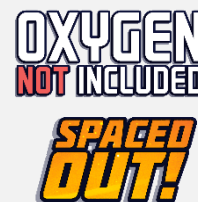
Cycle 500



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CH 10: Nuclear Enrichment



1) Everything explored

By Cycle 438, we had explored all of space. As predicted, it took 6 trips to make it happen.

We know what all resources are available to us, whether on planets or in other forms. As luck would have it, the planet I was looking for the most was the last thing I found. Soakenza (Renamed – Numenor) was discovered in Cycle 403 and the grand prize of Chillinzi (Renamed – Svalbard) was found in cycle 430. Check the star map at the beginning of the chapter for more details.

Svalbard was what I have been looking for since I started the game, pretty much. Any of you who know what Svalbard is might have guessed that it has an abundance of ice and seeds (Sleat wheat, specifically). But more importantly for us, it has iron volcanos. I'm not sure how much iron this will produce for us, but something is better than nothing.

Numenor is also important – not for its water but for what lies underneath. The planet has a lot of lime and fossil at the bottom of the map, which I will need for steel production as well.

My first rocket on Svalbard landed on Cycle 424 and my first Rocket on Numenor landed on Cycle 476.

2) Life on Chernobyl -

Chernobyl isn't connected to the main planet by teleporter or anything, but it's still pretty close by and takes half a cycle by rocket. So much so that you don't need a fully specced out rocket to transport duplicants. The rocket does not even really need a food or oxygen supply.



We've made a few trips on and off Chernobyl, mainly to pick up gold for our oxylite refiners. But now it's time to get to the other important resource on the planet – uranium.

Before we do that though, We need to set up an atmosuit network, because right now our digging speed has been really inefficient. After all, my dupes keep running out of breath. But for atmosuits, I need piped oxygen. I can get oxygen from algae or oxylite, but piping it is a challenge and it's not a sustainable source of oxygen.



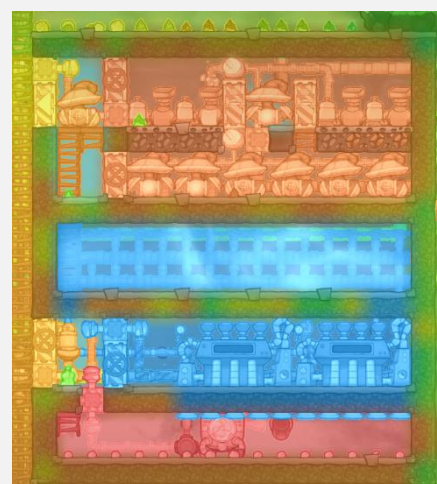
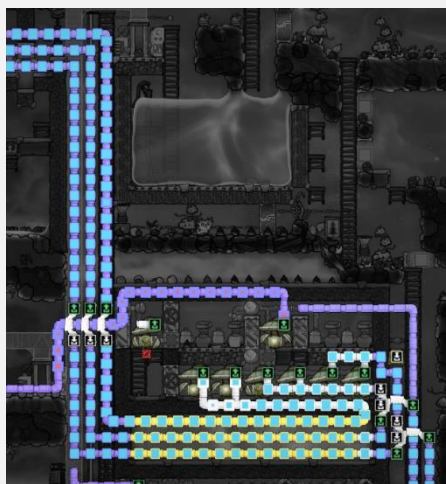
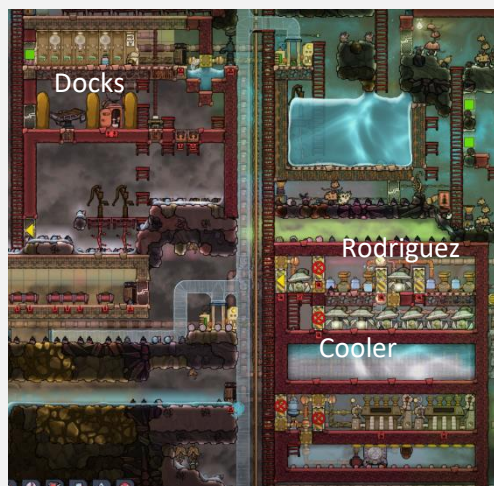
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CH 10: Nuclear Enrichment

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So I just bit the bullet and made a Rodriguez on Chernobyl. And because I did not have a source of cold water lying around, I also created a cooling system for it. By cycle 417, we had a full atmosuit set up and we were ready to go.



The cooling system works on a liquid loop with an aquatuner. The liquid loop cools a pool of water, which in turn cools the gas pipes. Both gas pipes and liquid pipes are made of radiant material. You can play around with the temperatures till you get to one you find suitable.

I also take the time to set up a tube network on the planet, that would allow us to move around the place much faster. Apart from that, we have the usual trimmings of a base, including a great hall and a nature reserve.

For food, we have opted to grow mealwood for some time, when I was not comfortable getting food from Neo terra. Now, we have enough spare food on Neo Terra that I'm not going to use (Like grubfruit preserve, for instance. I'll just get all that to Chernobyl as and when I need it to. I will have to monitor my food reserves on all my planets though, all my duplicants could starve.



We've also been busy doing a bunch of digging and the planet looks practically unrecognisable. The fallen satellite is a good added touch. I wonder if I can put that radiation to good use.....

I've also tamed a hydrogen vent, but the vent was dormant when I completed it, so let's talk about that next time.



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CH 10: Nuclear Enrichment

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3) Bee Keeping –



Beetas are interesting. Unlike most other critters, they don't need to be groomed and don't suffer from crowding debuffs. Also, as far as I can tell, hives don't starve (Apparently they do but they automatically replant themselves). As long as the temperature is in the right range, the hive lives forever.

Why bees? Because bees consume Uranium ore and give out Enriched uranium at 90% efficiency. The Uranium centrifuge, on the other hand, has an efficiency of 10%. No points for guessing what our preferred option is.



The uranium biome isn't actually that radioactive, meaning that you don't need radiation suits of any kind to get in. I do put a liquid lock in place to lock in the cold temperatures and not let them leak. Here we have two liquid locks with a vacuum between them. This completely arrests any temperature transfer from the area.

I demolish the entire nuclear biome to make my enriched uranium. The downside is that this cuts your uranium ore reserves by half (when you demolish a tile, you get only half of its resources, whereas a bee can harvest the full thing. In theory anyway)



In practice, this 'natural harvesting' of uranium is a slow and tedious process. The beehives spend half their time not having enough food and the output of uranium is not reliable. On top of that, all that bee movement plays havoc with your framerates, especially if you've got a lot of hives. As someone playing on a laptop, I have to be very cognizant of the limitations of my hardware. The sky isn't the limit when it comes to my



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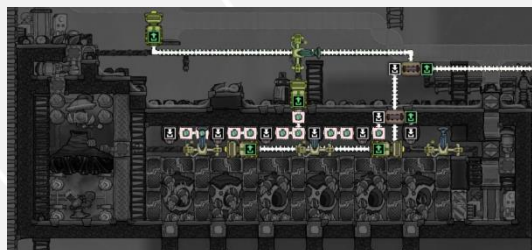
CH 10: Nuclear Enrichment



imagination, my silicon is. So let's see how we can make enriched uranium a bit more efficiently.



My Uranium production brick is pretty simple – 6 bee hives in a temperature-controlled environment. The cooling comes from the CO2 geyser that produces cold CO2. The box is completely sealed off with insulated tiles. The access point for the tube network and the power wire is sealed off with a vacuum lock, and the build is completely automated and does not need any duplicant intervention, except to harvest uranium from it.



So how exactly do you 'grow' new hives? Using doors. of course.

So how Beetas work is that when the hive produces larva (known as beetiny), the larva can do one of 2 things. If the beetiny is in the proximity of a hive that it can reach, it will mature into a beeta. If not, it will develop into a new hive.

So all we have to do is create a series of small rooms with doors and drop a beetiny into each of these rooms. Beetiny's can be wrangled and dropped like any other critter, and once they are dropped into the room, the critter dropoff can be deconstructed. Here because of the doors, the beetiny feels that it isn't near a hive and will develop into one. Once the hive fully matures it will automatically start producing beetinies and by extension beetas. This will give you a row of hives, all right next to each other.

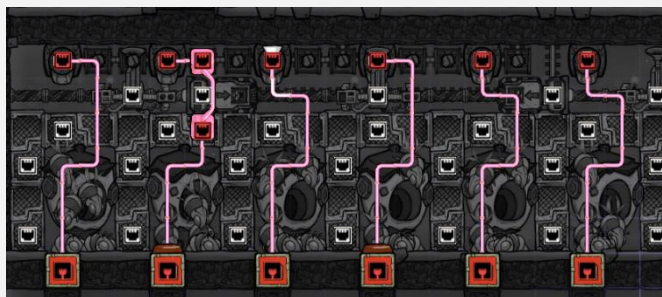


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CH 10: Nuclear Enrichment

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The uranium ore delivery mechanism is simple – a weight plate attached to a chute. When the weight goes below 20 kg, the chute opens and drops some more. All I have to do is ensure all the uranium ore is directed to the conveyor loader. Right now I do this manually, but it can be automated.

I expect this setup to be operational for the entire game. At some point, I might consider adding some cooling to supplement the CO2 vent, but that will only be necessary if the input uranium is coming at a very high temperature,

Word of caution though, if the chamber overheats, your bees will die and you might lose your colony completely. I'm not sure if the game will spawn new hives if all your hives die. I have not seen beetinies pop up on the Printing Pod so far, but maybe that'll happen if you have no bees left on the map.

Anyway, hope we don't have to find out the hard way, because my late game will revolve around Uranium.

4) Colonizer I –

Chernobyl was an easy planet to colonize, given how close it is to our main planet. The others though are a different story, They are so far away that the duplicants have to eat, sleep and pee as the rocket finds its way through space. And unlike the explorer rocket, the colonizer has to function as a home-away-from-home that would allow the duplicants some creature comforts when they land on a hostile planet.





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CH 10: Nuclear Enrichment

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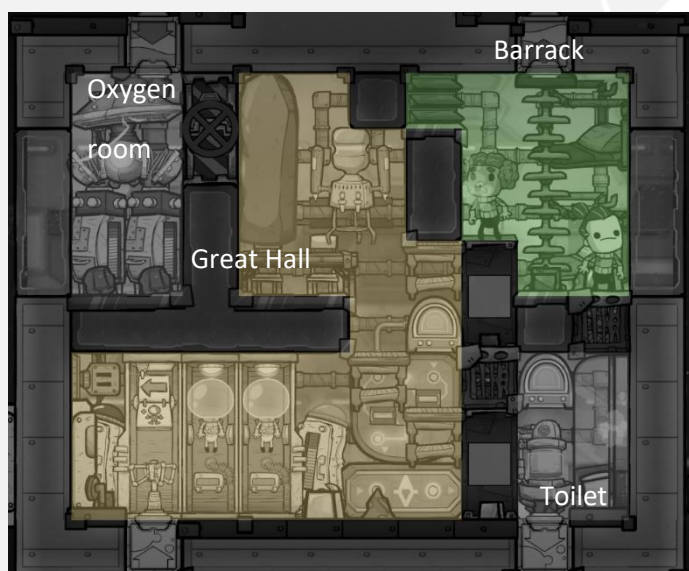
The exterior of the rocket is quite straightforward, with a petroleum and engine, liquid tanks, oxidizer tanks, and a battery. If a rocket is going to land on a new planet, we will have trailblazer modules attached, which can be deconstructed for repeat visits.

Let's now look at the insides.

With the limited space available, we have to be very careful of how we use it and where we put it. Here are the main things I wanted my rocket module to have –

- A supply of oxygen and a way to pipe it into Atmosuits
- Built-in atmosuits as part of the rocket
- A place to sleep
- A place to eat
- A place to pee
- Decent sources of morale
- Way to produce power or store power

The logic here is that the minute the colonizer lands on a planet, I shouldn't have to build a base immediately to get my dupes settled in. I can work directly on sustainability requirements such as a continuous source of power, atmosuit repair setup or a long-term oxygen solution.



Rooms are obviously the easiest way to get morale. But rooms have specific requirements, such as the absence of industrial buildings, which will be hard to fulfil. We air pumps to push oxygen into our atmosuits as well as Co2 out of the module, and both of these are industrial buildings, so we'll have to pick and choose what rooms we want.

Here is the setup I decided to go with.

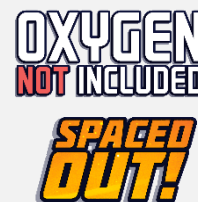
- 2 bins of oxylite in a sealed room with a pump in it. This room is not accessible to duplicants and I open it up only to refill it (40 tonnes of oxylite should last 2 duplicants 300+ cycles of continuous use.



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CH 10: Nuclear Enrichment



- A large mess hall. I build it with some trickery, as we did for our previous build such as the explorer rocket. The water cooler and metal block contribute to the status of the room as a great hall, but are actually not on the ground, because I deconstructed the tiles under them. Some might call it cheating, but I call it creativity. +6 morale in the bag.

Anyway, atmosuits and sensors don't count as industrial buildings, thank heavens. There isn't much space for storage, but there is enough place to build 2 bins near the atmosuit docks if you need to store something.

- A barracks with ladder beds. This gives them a space to sleep and a +1 morale.
- We have a place for them to pee, but it's not a room and does not give a bonus. It was the only place I could fit in a small pump to remove the excess gas. There is no way to clean hands, but in my experience, it's not really required. Hand sanitisers can leak chlorine sometimes, and I don't want to bother with it.
- I'll be using berry sludge as my source of food for the colonizer rockets, as they will not spoil with time. Keep in mind that at the moment we only have 1 Million (1.5 Million by cycle 500) calories of bristle berry, and no steady supply of sleat wheat to make more.

'1 million' might sound like a lot but that only comes up to 1000 meals, which will last my 17 duplicants 59 cycles. So we have to set our consumables permissions such that only duplicants on active rocket missions are eating it. On the flip side, make sure to check your permissions regularly, or your pilots will starve to death on missions even when there is plenty of food on the rocket.



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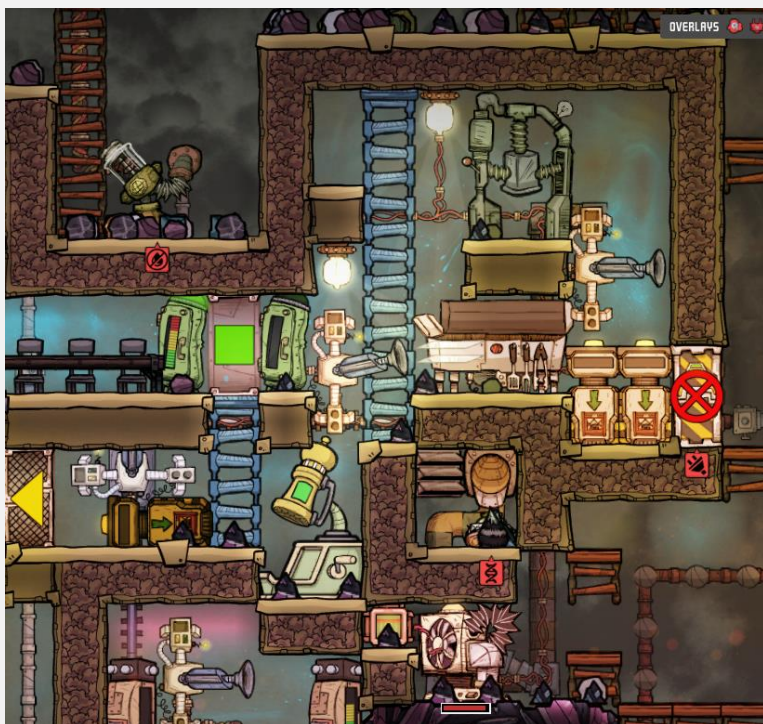


CH 10: Nuclear Enrichment

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5) Life on Neo Terra -

Not much has really changed on Neo Terra. We've dug up a bit more, cleaned up a bit more and done minor tweaks, but major updates are few.



We've started spicing low-grade foods so that they last longer and can be stored without special storage requirements. 'Freshener Spice' uses mealwood seeds and salt to increase the shelf life of food, to such an extent that simple refrigeration or storage in a CO2 pit is enough to keep them for long periods. This spiced food is what we are sending to Chernobyl and Petra.

We also added another set of desalinators, but that hasn't made much of a difference, it just reduces the downtime when one of the desalinators is being cleaned out.

6) Life on Petra

We've made some significant changes on Petra.



At cycle 400, we had tapped only 3 of the 5 oil wells, but now we have all 5 of them tapped in and running. This takes up a total of 1.67 kg/s of water, which is supplied by teleporter from Neo Terra. But this produces 16.67 kg/s of crude oil, whereas our teleporter can only handle 10 kg/s. This means we will build up excess crude oil on petra, which we need to use up somehow.



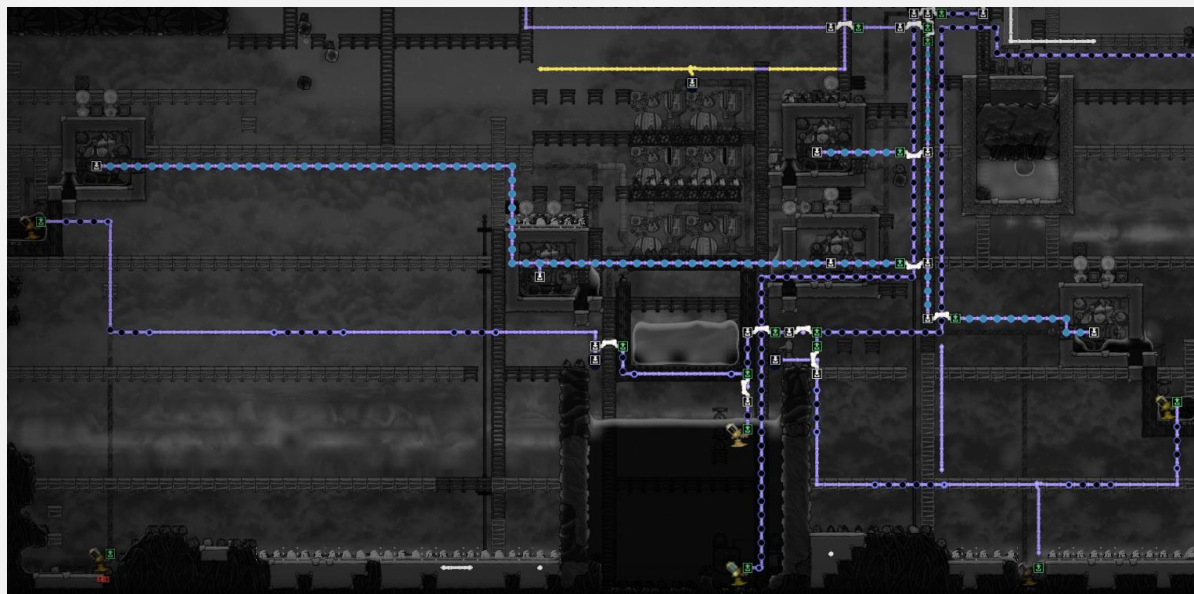
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CH 10: Nuclear Enrichment

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To use up this extra crude, I've set up 2 petroleum refiners, which need duplicant operation to turn 10 kg/s of crude oil to 5 kg/s of petroleum and some natural gas - a terrible deal when compared to our petroleum boiler setup but it's better than nothing.

The refiners have been built as part of the natural gas vent chamber so that any gas produced by it will be automatically moved to the infinite storage. For now, I'm moving the petroleum into a small storage chamber, but something tells me it's not going to be enough for much longer.



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CH 10: Nuclear Enrichment

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We've set up 2 refineries so that two duplicants can work on it together if required. Crude fills the first storage first, moving to the second storage only when the first one is full. And to ensure that dupes don't waste too much time refining, we've also added some automation to ensure the refineries are active only once the storage hits 70%.

We also opened up the sulphur vent, but without a cooling setup, the liquid sulphur couldn't convert to a solid. Ultimately the vent just ended up resealing itself. Ah well, a different problem for a different day.

We've also consumed all the water we had on the planet, meaning that the bristle berry growing operation has halted. It was good while it lasted.

Finally, we've replaced the refined wiring with heavy-watt wire, as our total circuit load had crossed 2000 kW. Heavy-watt conductive wire is a bit overkill and wasteful in this situation, as refined metal is hard to come by at the moment.

7) Life on Svalbard –

There is currently no life on Svalbard, but we have a foothold on it.





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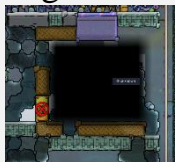
CH 10: Nuclear Enrichment

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How we can colonize planets using trailblazer modules has already been covered in previous chapters, so I'm not going to repeat that here. But once we're on the planet, we set up some coal generators for energy and an exosuit forge for atmosuit repairs. The rest of the core base is already in the rocket. My duplicants can basically now live on the planet for long periods, but I can't leave them behind to fend for themselves yet.

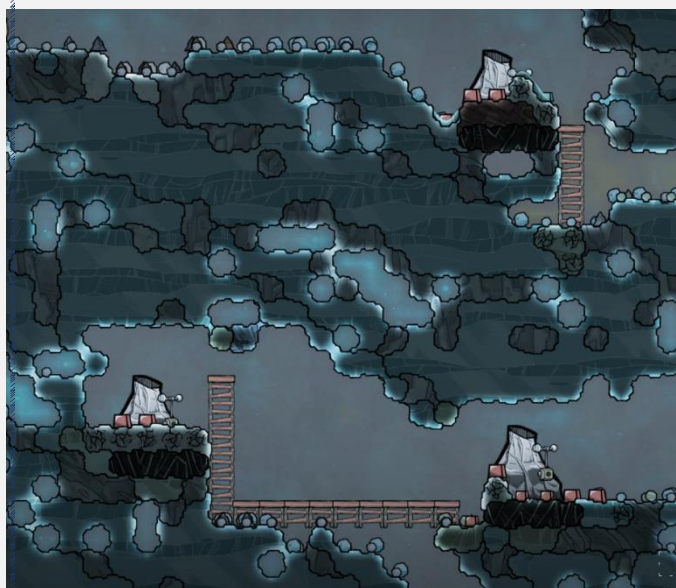
Svalbard is basically a ball of ice, with only 2 things of interest. One is the sleat wheat, which will give us a natural source of grain for a while, thereby boosting our berry sludge production (Hence the name Svalbard). The second is iron volcanos, which will augment our steel production.



There is also this unknown entity on the planet, right near our rocket platform. But I'm sure that'll be of no consequence later on. Right?

In the last 100 cycles, I've made 2 trips to Svalbard. The first trip was to set up the core base and dig up all those beautiful Iron volcanos. I also find a bunch of sleat wheat lying around, which I stored out in a vacuum to preserve indefinitely. This was around cycle 450.

The 2nd trip was around cycle 490, to pick up some of that sleat wheat to iron to take back to neo terra. The 'Colonizer 1' is almost at Neo Terra at cycle 500.



Finally, I have a source of Iron! I've been talking about needing iron for my steel production for quite a while now. But we finally have access to it, which marks a major milestone in our game. The 4 volcanos put together will give us about 835 kg of Iron a cycle for the rest of the game.

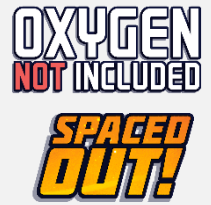
I had reed fibre, coal, refined metal, steel and some metal ore in my rocket since the planet would not have any. The iron on the planet was only accessible after many cycles of digging.



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CH 10: Nuclear Enrichment



8) Life on Numenor –

There is no life on Numenor either, but we have the same power grid and atmosuit repair setup in place. But this planet is not like the others. This planet could kill you.

I mean, any planet could kill you, but we're at a stage where that's not too likely. The availability of oxygen or food is always a concern but now that we have our colonizer rockets, not so much. Sure, Svalbard is super cold, for example. And we have no oxygen there. But when your dupes are in an atmosuit, none of that matters.

The issue with Numenor is that our dupes can't swim or fly. And there isn't all that much land to walk on.



It's a long way down.

The little patch of land where we land is probably one of the bigger land patches on the planet, with the bulk of the planet being made of water. And water can kill you.

- If you land your duplicants on the island and don't deconstruct the trailblazer modules properly, the metal that we get from them could fall into the water. If that happens, the metal will sink all the way to the bottom, out of reach of your dupes.

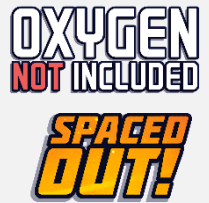
It's unlikely that your dupes will be able to build a ladder to reach the metal before they run out of oxygen. Without the metal from the pod, you can't build your rocket platform. In short, If your starting metal falls into the water, your dupes will die.



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CH 10: Nuclear Enrichment



- Dupes are idiots. If you queue up a bunch of dig commands and leave them unsupervised, They're very likely to strand themselves in some corners. In most planets, that's an annoyance. On this one, one wrong move could send your duplicant tumbling into the water and onto the ocean floor. Getting them back up could be a major problem.

At face value, this is not as bad as option 1, but there is still a solid chance you won't be able to rescue them before they die.

Just as on Svalbard, I had reed fibre, coal, refined metal, steel and some metal ore in my rocket, since the planet would not have any.

9) Base Check-

The following tech was researched

- New Media
- Radiation refinement
- Pressurized forging
- Multiplexing



All systems are running well. We have a steady supply of food, oxygen, water, petroleum and power. I showed you a bunch of screenshots of the base in the previous chapter, so I'll skip them here.



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CH 10: Nuclear Enrichment



10) Comparison To The StormFather's Guide to the Galaxy-



In SGG, we made our first petroleum rocket at cycle 500. In some ways, we clearly are a lot more advanced this time around, having completed space exploration and having set foot on 4 new planets, as compared to 2 in SGG.

We also have Iron now, which came much later in SGG, so I'm quite happy with my pivot in strategy for the current playthrough.

Last time around I also went into Drecko ranching quite early, for reed and plastic. But while I love ranching in general and Dreckos in particular, I think I'm going to try a different approach this time. Let's see how that goes.

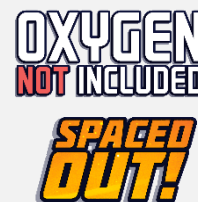
Our dupes aren't living as luxuriously as they did last time around, but that's fine. As long as they have enough morale to not cry on the job, I have no complaints.



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CH 10: Nuclear Enrichment



Author's Note –

Thank you for taking the time to check out Project Shatterstar. I hope this helps you to up your game. Each episode will be updated when necessary, so do keep an eye on the change history.

This series is a labour of love and an attempt to create quality written content. It does take up a lot of effort, though, so If you do like the work, please share and recommend it actively. You can also support me directly if you are willing and able.

There is always scope for improvement and new perspectives, so I encourage you to reach out to me if you have any specific thoughts on the work, be it good, bad or ugly. Reddit is the best way to get a hold of me. Do follow me there to keep up to date with the latest on what I do.

Check out the 'Stormfather's Guide to the Galaxy' and 'Academy Not Included', both of which are series that I built on Reddit. SGG is now scrapped, thanks to some complications when Spaced Out came out of Beta. But ANI will continue in some form or another.

Reddit is also the perfect place to point out any errors in the file. Due credit will be given to those who find errors or provide feedback that is incorporated into the file.

To check out any past or future work, or to support or follow me, do check out the following link-

<https://linktr.ee/Stormfather>

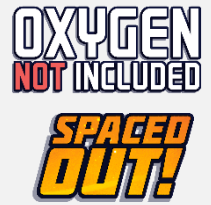
Until next time



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CH 10: Nuclear Enrichment



Change History –

| Date | Version | Change | Credits |
|--------------------------|---------|-------------|---------|
| 26 th Feb '23 | 0 | New Release | - |
| | | | |
| | | | |
| | | | |



StormFather